January 13, 2026

Paul and Natalie Boyd
PO Box 188
Melstone, MT 59054

Subject: Correct and Complete Application for Beneficial Water Use Permit No. 40C 30170690

Dear Applicant,

The Department of Natural Resources and Conservation (Department or DNRC) has determined that your application is correct and complete pursuant to ARM 36.12.1601. Please remember that correct and complete **does not mean that your application will be granted.** The purpose of this letter is to indicate that the Department has enough information to analyze your water right application.

The Department will issue a Draft Preliminary Determination within 60 days of the date of this letter per §85-2-307(2)(b), MCA.

Following issuance of the Draft Preliminary Determination, you (Applicant) will have 15 business days to request an extension of time to submit additional information, if desired pursuant to §85-2-307(3)(a), MCA.

If no extension of time is requested and the Draft Preliminary Determination decision is to grant your application or grant your application in modified form, the Department will prepare a notice of opportunity to provide public comment, per §85-2-307(4)(a), MCA.

If no extension of time is requested and the Draft Preliminary Determination decision is to deny your application, the Department will adopt the Draft Preliminary Determination as the final determination per §85-2-307(3)(d)(ii), MCA.

If you have any questions or concerns about the application process, please contact me.

Sincerely,

Christine Schweigert
Hydrologist
Billings Regional Office
cschweigert@mt.gov
406-247-4419
1371 Rimtop Drive, Billings, MT 59105

CC: Pat Riley

APPLICATION TO CHANGE A WATER RIGHT

§ 85-2-302, MCA

Form No. 606 *(Revised 10/2025)*

For Department Use Only

RECEIVED

DEC 19 2025

DNRC-WRD-BILLINGS

Application # 30170690 Basin 40C

Priority Date 12/19/2025 Time 11:30 AM/PM

Rec'd By CO

Fee Rec'd $ 1000.00 Check # 1439

Deposit Receipt # BLS 26l2731

Payor Paul Boyd

Refund $ _____ Date _____

FILING FEE

$2500/$1500 – Without/with filing fee reduction.

$400 – ***(The following types do not qualify for a filing fee reduction)***

- **Replacement well greater than 200 feet from original**
- **Replacement reservoir on the same source**

INFORMATION

An application will be eligible for a filing fee reduction and expedited timelines if the applicant completes a preapplication meeting with the Department (ARM 36.12.1302(1)), which includes submitting any follow-up information identified by the Department (ARM 36.12.1302(3)(c)) and receiving either Department-completed technical analyses or Department review of applicant-submitted technical analyses (ARM 36.12.1302(4) and (5)). An application for the proposed project also must be submitted within 180 days of delivery of Department technical analyses or scientific credibility review and no element on the submitted application can be changed from the completed preapplication meeting form (ARM 36.12.1302(6)). If application is eligible for a filing fee reduction, $500 paid for Form 606P-B will be credited toward filing fees shown above.

Applicant Information: *Add more as necessary.*

Applicant Name Paul Boyd

Mailing Address P.O. Box 188 City Melstone State MT Zip 59054

Phone Numbers: Home _____ Work _____ Cell _____

Email Address _____

Applicant Name Natalie Boyd

Mailing Address P.O. Box 188 City Melstone State MT Zip 59054

Phone Numbers: Home _____ Work _____ Cell _____

Email Address _____

Applicant Name _____

Mailing Address _____ City _____ State _____ Zip _____

Phone Numbers: Home _____ Work _____ Cell _____

Email Address _____

Contact/Representative Information: *Add more as necessary.*

Contact/Representative is: ☐ Applicant ☑ Consultant ☐ Attorney ☐ Other

Contact/Representative Name Pat Riley

Mailing Address 201 Canyon RD City Roundup State MT Zip 59072

Phone Numbers: Home 4063238733 Work _____ Cell 4066983056

Email Address priley75@yahoo.com

NOTE: *If a contact person is identified as an attorney, all communication will be sent only to the attorney unless the attorney provides written instruction to the contrary (ARM 36.12.122(2)). If a contact person is identified as a consultant, employee, or lessee, the individual filing the water right form or objection form will receive all correspondence and a copy may be sent to the contact person (ARM 36.12.122(3)).*

Answer every question and applicable follow-up questions. Use the checkboxes to denote yes ("Y"), no ("N"), or not applicable ("NA"). Questions that require items to be submitted to the Department have a submitted ("S") checkbox, which is marked when the required item is attached to the Application. Label all submitted items with the question number for which they were submitted. Narrative responses that are larger than the space provided can be answered in an attachment. If an attachment is used, specify "see attachment" on this form, and label the attachment with the question number. Constrain narrative responses to the specific question as is asked on the form; do not respond to multiple questions in one narrative. Responses in the form of a table may be entered into the table provided on this form or in an attachment. If an attachment is used, the table must have the exact headings found on this form, and "see attachment" must be entered as a response to the relevant question. Clearly label all units in tables and narrative responses.

PREAPPLICATION AND TECHNICAL ANALYSES INFORMATION

1. ☑ **Y** ☐ **N** Do you elect for Department technical analyses to be used for criteria assessment?

2. ☑ **Y** ☐ **N** Did you have a preapplication meeting AND complete a Change Preapplication Meeting Form Part A and Part B (Form 606P-A and 606P-B)?

IF QUESTION 2 IS NO, answer 2.a and 2.b:

2.a. ☐ **S** Submit the Technical Analyses Addendum (Form 606-TAA).

2.b. ☐ **S** ☐ **NA** Submit the technical analyses, if you elected in question 1 for Applicant technical analyses to be used for criteria assessment. Select "NA" if you elected for Departmental technical analyses.

IF QUESTION 2 IS YES, answer 2.c, 2.d, and 2.e:

2.c. ☐ **Y** ☑ **N** Has any element of the project described in this application changed from the mandatory elements of the project described in the completed Form 606P? **If yes,**

2.c.i. Please explain.

2.c.ii. ☐ **S** Submit the Technical Analyses Addendum (Form 606-TAA).

see 2.d/e **2.d.** ☑ **Y** ☐ **N** Are the technical analyses to be used for criteria assessment exactly the same as those completed during the preapplication process? **If no:**

2.d.i. Please explain.

2.d.ii. ☐ **S** Submit the Technical Analyses Addendum (Form 606-TAA).

2.e. ☑ **Y** ☐ **N** Did you elect in question 1 for Department technical analyses to be used for criteria assessment? **If no:**

2.e.i. ☑ **S** Submit the technical analyses.

APPLICATION ADDENDA AND REVIEW

3. ☐ **S** ☑ **NA** If the proposed change involves one or more places of storage, submit a Change Storage Addendum (Form 606-SA). This does not include reservoirs, pits, pit-dams, or ponds with a capacity less than 0.1 AF; water tanks; or cisterns (ARM 36.12.113(6)).

4. ☐ **S** ☑ **NA** If the project involves an appropriation that is greater than 5.5 CFS and 4,000 acre-feet, submit a Reasonable Use Addendum (Form 606-B).

5. ☐ **S** ☑ **NA** If the project involves out-of-state water use, submit an Out-of-State Use Addendum (Form 600/606-OSA).

6. ☐ **S** ☑ **NA** If the proposed purposes include marketing or selling water, submit a Water Marketing Purpose Addendum (Form 600/606-WMA). This doesn't include marketing for mitigation/aquifer recharge.

7. ☐ **S** ☑ **NA** If the proposed purpose includes instream flow, submit a Change to Instream Flow Addendum (Form 606-IFA).

8. ☐ **S** ☑ **NA** If the proposed purposes include mitigation, aquifer recharge, or marketing for mitigation/ aquifer recharge, submit a Mitigation Purpose Addendum (Form 606/606-MIT).

9. ☑ **S** ☐ **NA** If the project is in designated sage grouse habitat, submit a review letter from the Montana Sage Grouse Habitat Conservation Program.

10. ☐ **S** ☑ **NA** If you propose to add a point of diversion or place of use on State of Montana Trust Land, submit documentation of consent from DRNC Trust Lands Management Division. If you propose to add a place of use on Trust Land with all points of diversion on private land, then, at a minimum, that component of the change authorization will be temporary for the duration of the lease term (§ 85-2-441, MCA).

11. ☐ **Y** ☑ **NA** You must provide a written notice of the application to each owner of an appropriation right sharing a point of diversion or means of conveyance (e.g., canal, ditch, flume, pipeline, or constructed waterway) pursuant to § 85-2-302(4)(c), MCA. Submit a copy of this notice and the recipient list.

APPLICATION DETAILS

12. How many change applications will be needed for this project? Refer to ARM 36.12.1305 for more information. 1

13. Fill out the table below for the water rights proposed for change.

Water Right No.	Current Authorized Flow Rate			Flow Rate Needed for Project			Means of Diversion
	Flow	*GPM*	*CFS*	*Flow*	*GPM*	*CFS*	
40C 167385 00	1.71	☐	☑	1.71	☐	☑	PUMP
40C 167386 00	.61	☐	☑	.61	☐	☑	PUMP
40C 167387 00	2.05	☐	☑	1.38	☐	☑	PUMP
40C 167389 00	1.82	☐	☑	0	☐	☐	PUMP
40C 19338 00	3.12	☐	☑	0	☐	☐	PUMP

14. Is the source surface water or groundwater? SURFACE WATER

15. What is the source name? MUSSELSHELL RIVER

16. Identify the water right elements proposed for change, with a checkmark, for each water right proposed for change.

Water Right No.	40C 167385 00	40C 167386 00	40C 167387 00	40C 167389 00	40C 19338 00
Point of Diversion	☑	☑	☑	☑	☑
Place of Use	☑	☑	☑	☑	☑
Purpose of Use	☐	☐	☐	☐	☐
Place of Storage	☐	☐	☐	☐	☐

17. ☑ **S** Submit a historical use map created on an aerial photograph or topographic map that shows the following: section corners, township and range, scale bar, north arrow, all historical points of diversion (POD) labeled with a unique POD ID ("H" followed by a number), all historical places of use (POU), all historical conveyance structures, all historical places of storage, and historical place of use for all overlapping water rights. More than one map may be submitted, if necessary, to clearly convey all required information.

See Attach 17

18. ☑ **S** Submit a proposed use map created on an aerial photograph or topographic map that shows section corners, township and range, scale bar, north arrow, and the following elements: points of diversion labeled with a unique POD ID ("P" followed by a number), places of use, conveyance structures, places of storage, and place of use for all overlapping water rights. Include all elements that will be on the water rights after the proposed change, regardless of whether the element will be modified by the change. The map should fully depict the water rights, as proposed, after the change. More than one map may be submitted, if necessary, to clearly convey all required information.

See Attach 18

19. ☑ **Y** ☐ **N** Does the proposed change involve a change in point of diversion?

IF YES,

19.a. Describe the location for all *new* and *unchanged* points of diversion to the nearest 10 acres. Label POD ID with the same POD ID number assigned for the proposed use map (question 18).

POD ID	¼	¼	¼	Sec.	Twp.	Rge.	County	Lot	Block	Tract	Subdivision	Gov. Lot	New or Unchanged
P1	W2	SE	SE	29	12N	31E	ROSEBUD				TRANSITORY		NEW
P2	NW	NE	SW	~~19~~ 29	12N	31E	ROSEBUD				TRANSITORY		NEW

19.b. ☑ **NA** Describe the location of all historical PODs you propose to *retire*. Label POD ID with the same POD ID assigned for the historical use map (question 17). If none are proposed for retirement, select "NA" checkbox.

POD ID	¼	¼	¼	Sec.	Twp.	Rge.	County	Lot	Block	Tract	Subdivision	Gov. Lot
H1	SW	SE	SE	29	12N	31E	ROSEBUD				40C 167385-00	
H2	SW	SE	SE	29	12N	31E	ROSEBUD				40C 167386-00 #1	
H3	NW	SW	NW	33	12N	31E	ROSEBUD				40C 167386-00 #2	

19.c. What is the means of diversion for all *new* PODs? Means of diversion for surface water includes headgate, pump, dam, and others. Means of diversion for groundwater includes well, developed spring, pit pond, and others.

TRANSITORY PUMP

20. ☑ **Y** ☐ **N** Does the proposed change involve a change in place of use?

IF YES,

20.a. What are the geocodes of the proposed place of use?

29-2153-29-4-01-01-0000	
29-2153-29-1-01-01-1239	
29-2153-28-2-01-01-1480	

20.b. Describe the legal land description of the proposed place of use, and if the water rights being changed will have an irrigation or lawn and garden purpose, list the number of irrigated acres.

Acres	Gov't Lot	¼	¼	¼	Sec.	Twp.	Rge.	County
102				W2	28	12N	31E	ROSEBUD
84.4				E2	29	12N	31E	ROSEBUD
186.4	***Total***							

19.b. ☑ **NA** Describe the location of all historical PODs you propose to *retire*. Label POD ID with the same POD ID assigned for the historical use map (question 17). If none are proposed for retirement, select "NA" checkbox.

POD ID	¼	¼	¼	Sec.	Twp.	Rge.	County	Lot	Block	Tract	Subdivision	Gov. Lot
H4	NW	SW	NW	33	12N	31E	ROSEBUD				40C 167386-00 #3	
H5	NW	NW	SE	20	12N	31E	PETROLEUM				40C 167387-00	
H6	NE	SE	NW	29	12N	31E	ROSEBUD				40C 167389-00	

19.c. What is the means of diversion for all *new* PODs? Means of diversion for surface water includes headgate, pump, dam, and others. Means of diversion for groundwater includes well, developed spring, pit pond, and others.

TRANSITORY PUMP

20. ☑ **Y** ☐ **N** Does the proposed change involve a change in place of use?

IF YES,

20.a. What are the geocodes of the proposed place of use?

29-2153-29-4-01-01-0000	
29-2153-29-1-01-01-1239	
29-2153-28-2-01-01-1480	

20.b. Describe the legal land description of the proposed place of use, and if the water rights being changed will have an irrigation or lawn and garden purpose, list the number of irrigated acres.

Acres	Gov't Lot	¼	¼	¼	Sec.	Twp.	Rge.	County
102				W2	28	12N	31E	ROSEBUD
84.4				E2	29	12N	31E	ROSEBUD
186.4	***Total***							

19.b. ☑ **NA** Describe the location of all historical PODs you propose to *retire*. Label POD ID with the same POD ID assigned for the historical use map (question 17). If none are proposed for retirement, select "NA" checkbox.

POD ID	¼	¼	¼	Sec.	Twp.	Rge.	County	Lot	Block	Tract	Subdivision	Gov. Lot
H7	SE	SE	NE	32	12N	31E	ROSEBUD				40C 19338-00	

19.c. What is the means of diversion for all *new* PODs? Means of diversion for surface water includes headgate, pump, dam, and others. Means of diversion for groundwater includes well, developed spring, pit pond, and others.

TRANSITORY PUMP

20. ☑ **Y** ☐ **N** Does the proposed change involve a change in place of use?

IF YES,

20.a. What are the geocodes of the proposed place of use?

29-2153-29-4-01-01-0000	
29-2153-29-1-01-01-1239	
29-2153-28-2-01-01-1480	

20.b. Describe the legal land description of the proposed place of use, and if the water rights being changed will have an irrigation or lawn and garden purpose, list the number of irrigated acres.

Acres	Gov't Lot	¼	¼	¼	Sec.	Twp.	Rge.	County
102				W2	28	12N	31E	ROSEBUD
84.4				E2	29	12N	31E	ROSEBUD
186.4	***Total***							

21. ☑ **Y** ☐ **N** Does the proposed change involve a change in place of use or purpose?

IF YES,

21.a. ☐ **Y** ☑ **N** Do other water rights supplement or overlap the proposed place of use?

IF YES,

21.a.i. How will the water rights be operated to serve the proposed purposes?

_____

_____

_____

_____

21.a.ii. For each supplemental or overlapping water right, please list the average period of diversion and use (MM/DD-MM/DD), flow rate (GPM or CFS), and the volume of water (AF) contributed.

Water Right No.	**Avg. Period of Diversion**	**Avg. Period of Use**	**Flow Rate**			**Volume Contributed**
	MM/DD-MM/DD	*MM/DD-MM/DD*	*Flow*	*GPM*	*CFS*	*AF*
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	

22. ☐ **Y** ☑ **N** Are you filing on behalf of another entity? If yes, describe.

_____

_____

23. ☑ **Y** ☐ **N** Do you own the entire historical place of use for all water rights proposed for change?

IF QUESTION 23 IS NO,

23.a. ☐ **Y** ☐ **N** Was the water historically used for sale, rental, distribution, municipal use, or any other context in which water is being supplied to another and it is clear that the ultimate user would not accept the supply without consenting to the use of water on the user's place of use?

IF QUESTION 23.a IS NO,

23.a.i. ☐ **Y** ☐ **N** List the water rights for which you do not own the entire historical place of use.

_____

23.a.ii. ☐ **Y** ☐ **N** Are the water rights listed in question 23.a.i severed from the historical place of use?

IF QUESTION 23.a.ii IS YES,

23.a.ii.1. ☐ **Y** ☐ **N** Do you own the entirety of the severed water rights proposed for change? If yes, skip to question 24. If no, answer question 23.a.iii.

IF QUESTION 23.a.ii OR 23.a.ii.1 IS NO,

23.a.iii. ☐ **Y** ☐ **N** ☐ **NA** Are all owners of the historical place of use or, if applicable, owners of the severed water rights, willing to sign the application?

IF QUESTION 23.a.iii IS NO,

23.a.iii.1. ☐ **S** Submit a Form 641 or 642 to split the water rights being changed for which all owners will not sign.

ADVERSE EFFECT

24. Explain how you can control your diversion in response to a call being made.

WE HAVE A WATRE COMMISIONER ON THE ENTIRE MUSSELSHELL RIVER AND HAVE COURT ORDERED FLOW METERS FOR ALL PUMPS. CALLS ARE ORDERED AND REGULATED BY WATER COMMISSIONERS. A WEBSITE POSTS USEABLE PRIORITY DATES AND IS UPDATED WHENEVER WATER AVAILABLITY CHANGES. wE CAN AND WILL SHUT DOWN IF A CALL IS MADE OR WHENEVER3 OUR HISTORICAL DIVERTED OR CONSUMED VOLUME IS DIVERTED OR IF OUT OF PRIORITY DATE

25. Describe any plans you have for ensuring existing water rights will be satisfied during times of water shortage.

MUSSELSHELL COMMISIONERS ENFORCE PRIORITY DATES ON ENTIRE RIVER AND ENSURE EXISTING PRIORITY DATES /RIGHTS ARE ENFORCED AND PROTECTED AT ALL TIMES DURING IRRIGATION SEASON. I HAVE OBTAINED THE USE OF 100 SHARES OF DEADMAN'S BASIN STORED WATER TO USE WHEN I HAVE USED ALL MY EXISTING WATER RIGHTS OR MY PRIORITY DATES HAVE BEEN CALLED UPON.

26. ☑ **Y** ☐ **N** Are you aware of any calls that have been made on the source of supply or, if groundwater, on nearby surface water sources?

26.a. If yes, explain.

THE MUSSELSHELL WATER COMMISIONERS SETTLE ALL CALLS ALL OT THE TIME THROUGHOUT THE IRRIGATION SEASON.

27. Describe how the proposed change will or will not affect your ability to make call.

MUSSELSHELL WATER COMMISSIONER ENFORCES PRIORITY DATES AND I REPORT MY WATER USAGE VIA THEIR WEBSITE THROUGHOUT THE IRRIGATION SEASON. MY PROPOSED POD'S ARE ONLY ON MY PROPERTY. NO OTHER DIVERSION BETWEEN.

28. ☑ **Y** ☐ **N** Does a water commissioner distribute water or oversee water distribution on your proposed source, or if groundwater, on nearby surface water sources?

28.a. If yes, list the sources.
MUSSELSHELL RIVER

29. When was the last time each water right proposed for change was appropriated and used beneficially?
2025

IF THERE HAS BEEN A PERIOD OF NONUSE,

29.a. Why was the water right not used?
ONLY AFTER 100 YEAR FLOOD OF 2011 WHEN THE RIVER CHANNEL MOVED AND WASHED AWAY MOST OF THE EXISTING PUMPS, PIPES AND MANY DITCHES. THIS DAMAGE OCCURED THROUGHOUT THE MUSSELSWHELL RIVER VALLEY

29.b. Why will a resumption of use not adversely affect other water users?
N/A

29.c. ☐ **Y** ☑ **N** Is the period of nonuse greater than 10 years for any of the water rights proposed for change? If yes, list which water rights.

29.d. ☐ **Y** ☑ **N** Have new water rights been authorized to use the source during the period of nonuse for any of the water rights proposed for change? If yes, explain.

30. ☑ **Y** ☐ **N** Do you propose to add one or more points of diversion or use new or existing conveyance infrastructure that will be shared with one or more existing water rights?

30.a. If yes, describe how the capacity of the shared points of diversion and/or conveyance infrastructure is sufficient for all water rights and how the proposed project will not adversely affect these water rights.

PUMPS AND PROPOSED PUMPING PLANT INCLUDE A 4RB CORNELL WITH 40 HP ELECTIC MOTOR AND THE SECOND PUMP IS A 4HH CORNELL PUMP. THE COMBINED CAPACITY PROPOSED WITH 3 PHASE POWER IS 1,661.45 GPM OR 3.7 CFS SEE 30.a ATTACHED

31. ☐ **NA** Answer questions 31.a to 31.b for point of diversion changes. If you do not propose a point of diversion change, mark "NA" instead.

31.a. Are the proposed points of diversion upstream or downstream of the historical points of diversion?

BOTH UP AND DOWN BUT NO OTHER DIVERSIONS BESIDES BOYD HISTORIC DIVERSIONS BETWEEN.

31.b. ☐ **Y** ☑ **N** Are there intervening water users between the historical and proposed points of diversion?

31.b.i. If yes, list the water rights.

ADEQUATE MEANS OF DIVERSION AND OPERATION

32. ☑ **S** Submit a diagram of how you will operate your system from all proposed points of diversion to all proposed places of use.

See exhibit 32

33. Describe specific information about the capacity of all proposed diversionary structures. This may include, where applicable: pump curves and total dynamic head calculations, headgate design specifications, and dike or dam height and length.

SEE ATTACHMENT 30A /33

TWO MANIFOLDED PUMPS 1 4RB-40-3.4 CORNELL PUMP AND A 4HH CORNELL PUMP, WITH A COMBINED FLOW RATE OF 3.70 CFS. 3 PHAZE POWER INSTALLED TO PUMPSITE AND EACH PUMP WILL HAVE A FLOWMETER AND TOTALISER THIS SPRING AS REQUIRED BY THE MUSSELSHELL DISTRIBUTION PROJECT

4RB @ 40hp @ 140' TDH = 860 GPM
4HH @ 40hp @ 135' TDH = 801.45 GPM

34. Describe the size, materials, capacity, and configuration of infrastructure to convey water from all proposed points of diversion to all proposed places of use.

PUMPSITE SPLIT WITH 10' LINE GOING TO FULL PIVOT AND SECOND 10' PIPELINE SERVING HALF PIVOT AND FLOOD IRRIGATED LAND. SECOND PIPELINE REDUCED TO 6" LINES GOING TO HALF PIVOT AND 6" GOING TO FLOOD GROUND.
PVC PIPE IS BEING USED THROUGHOUTM PROJECT . THE PUMPING CAPACITY OF THE ENTIRE SYSTEM IS 3.70 CFS AND EACH PIPELINE CAN CONVEY APPROXAMENTLY 830 GPM GIVE THE hORSE POWER AND LIF REQUIRED FOR THIS PROJECT

PVC SCHEDULE 40 MAX @ 10" = 3,000 GPM
PVC SCHEDULE 40 MAX 2 6' = 800 GPM

SEE EXHIBITS 30A/33,32, AND 34 CC

35. ☐ **Y** ☑ **N** Does the proposed conveyance require easements?

35.a. If yes, explain.

36. Describe your plan of operations, including specific information about how water is delivered within the place of use. This may include, where applicable, the range of flow rates needed for a pivot.

FORM THE PUMPS WATER WILL BE DELIVERED TO 2 10" PIPELINES VIA MANIFOLDED 4HH AND 4 RB PUMPS. ONE 10" PIPELINE WILL ONLY SERVE THE FULL PIVOT AND THE OTHER 10" PIPELINE WILL SPLIT EAST OF THE FARMHOUSE ON THE BOYD RANCH AND THE 2 6" PIPELINES WILL SERVE THE 1/2 PIVOT AND THE OTHER 6' PIPELINE WILL SERVE THE 2 FLOOD FIELDS EAST OF THE HOUSE. INTIALLY BOTH PUMPS WILL IRRIGATE ALL OF THE PROPOSED POU BUT AT ANYTIME EITHER PUMP CAN BE SHUTOFF AND EITHER PIPELINE MAY ALSO BE SHUT OFF.

37. ☑ **Y** ☐ **N** ☐ **NA** If you propose to add one or more points of diversion, do you own the land where all proposed points of diversion are located? If you do not propose to add one or more points of diversion, mark "NA" instead.

37.a. ☐ **S** If no, submit documentation to show you have the right to use all points of diversion located on each property you do not own. This may include, but is not limited to, a well agreement, an easement, or permission of the party that owns the property where the proposed point(s) of diversion are located.

38. ☑ **Y** ☐ **N** Will your system be designed to discharge water from the project?

38.a. If yes, explain the wastewater disposal method.

YES ANY RETURN FLOWS WILL FLOW BACK TO THE MUSSELSHELL RIVER THROUGH DRAINS AND NATURAL DRAINAGE

38.b. ☐ **Y** ☐ **N** ☑ **NA** Have the necessary permits been obtained to comply with §§ 75-5-410 and/or 85-2-364, MCA?

39. ☐ **Y** ☑ **N** Is the means of diversion for any proposed point of diversion a well?

IF YES,

39.a. ☐ **Y** ☑ **N** Have all wells been drilled?

39.b. For all wells that have been drilled, what is the name of the well driller and, if available, what is their license number?

39.c. ☐ **Y** ☐ **N** ☑ **NA** For all wells yet to be drilled, will a licensed well driller construct the wells? If no wells are yet to be drilled, mark "NA" instead.

39.d. ☐ **S** ☑ **NA** Submit any well logs not yet submitted to the Department, such as for wells drilled after submittal of Form 606P. If all well logs have been submitted to the Department, mark "NA."

BENEFICIAL USE

40. ☑ **Y** ☐ **N** Does the Department have a standard period of diversion, period of use, flow rate, and/or volume for any of the purposes for which water is used? Department standards can be found in the DNRC Water Calculation Guide, ARM 36.12.112, ARM 36.12.115, and ARM 36.12.1902.

40.a. If yes, list the purposes for which the Department has a standard and note whether the water use falls within or outside the standard.
SYSTEM FALLS WITHIN THE STANDARD PERIOD OF USE TIME FRAMES

40.b. For any of the purposes with no Department standard or with proposed beneficial use that falls outside of Department standards, explain how the use is reasonable for that purpose.

41. ☐ **Y** ☑ **N** Will your proposed project be subject to Montana Department of Environmental Quality (DEQ) requirements for a public water supply (PWS) system or Certificate of Subdivision Approval (COSA)?

42. ☐ **Y** ☑ **N** Are you proposing to use surface water for in-house domestic use?

42.a. ☐ **Y** ☐ **N** If yes, does a COSA exist for the proposed place of use?

42.a.i. ☐ **S** If yes, submit the COSA.

POSSESSORY INTEREST

43. ☐ **Y** ☑ **N** Do you meet one of the exceptions to possessory interest requirements, pursuant to ARM 36.12.1802 and § 85-2-402(2)(d), MCA? Exceptions include cases where the application is for sale, rental, distribution, or is a municipal use, or in any other context in which water is being supplied to another and it is clear that the ultimate user will not accept the supply without consenting to the use of water on the user's place of use, and applications for the purposes of instream flow, mitigation, and marketing for mitigation.

43.a. If yes, explain.

_____

_____

_____

44. ☑ **Y** ☐ **N** ☐ **NA** Do you own all proposed places of use? Mark "NA" if you meet one of the exceptions to the possessory interest requirement.

44.a. ☐ **S** If no, explain and submit documentation that shows you either have possessory interest or written permission of the parties with possessory interest of the proposed place of use.

_____

_____

_____

PROPOSED COMPLETION PERIOD

45. How many years will be needed to complete this project and to submit to the DNRC a Project Completion Notice (Form 618)? 2 YEARS

46. Describe why this amount of time is needed to complete this project.
TIME TO ASSEMBLE SYSTEM, ASSEMBLE AND BURY PIPES

_____

_____

_____

_____

AFFIDAVIT & CERTIFICATION

Read carefully before you sign and review with legal counsel if you have any questions. All owners (or trustees) must sign the form. ***If the owner is a business or trust, include the title of the representative(s) signing the form (i.e., president, trustee, managing partner, etc.) and provide documentation that establishes the authority of the representative to sign the application.*

I affirm the information provided for this application is to the best of my knowledge true and correct. If a preapplication meeting form was submitted, I am aware that my application for this project will not qualify for a discounted filing fee and expedited timelines if upon submittal of the application to the Department, I changed any element of the proposed application from the preapplication meeting form and follow-up materials (ARM 36.12.1302(6)(a)).

I affirm I have possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use, unless this application meets an exception to the possessory interest requirements in ARM 36.12.1802(1)(b).

I understand that making a false statement under oath or affirmation in this application and official proceedings throughout the examination of my application may subject me to prosecution under § 45-7-202, MCA, a misdemeanor punishable by a jail term not to exceed 6 months or a fine not to exceed $500, or both. I have read this Affidavit and understand the terms and conditions.

I declare under penalty of perjury and under the laws of the state of Montana that the foregoing is true and correct.

Printed Name Paul Boyd

Applicant Signature Paul Boyd Date: 12/15/2025

Printed Name Natalie Boyd

Applicant Signature Natalie Boyd Date: Dec 18, 2025

Printed Name _____

Applicant Signature _____ Date: _____

Affidavit of Paul Boyd regarding history irrigation of Ranch he now owns and operates

Dated: April 7, 2025

Most of the information I have obtained regarding the irrigation on the ranch I purchased north of Melstone Montana was obtained from Art Kincheloe, who is about 70 years old and was born and raised on this ranch. Other items were gleaned from my personal observations from operating the property over the last 3 years. Mr. Kincheloe also operated the ranch for almost 60 years.

40C 167387-00 This water right services the further most north portion of my ranch and was irrigated with a 10" Crisafulli regular lift pump driven by 540 PTO off a 4020 John Deer tractor. 91 horsepower is the PTO rating of this tractor. This equipment was auctioned off before I purchased property and was obtained by a discussion with Mr. Kincheloe. With 10 feet of lift the flow rate from the pump curve indicates 3500 GPM.

It is also interesting to note that the claim's priority date lists 1963 but it appears on the Water Resources Survey as being irrigated under the Elliot Water Right of 6-1-1909 and appears on the 7/6/1954 aerial photo.

In 2011 during the 100-year flood on the Musselshell River the River developed a 15-foot bank where water was diverted. Mr. Kincheloe made several attempts to irrigate with limited success and over the last 8 years no further attempts have been made. Because of the deepening of the Musselshell River Channel, I cannot cross river on my property to get to field and irrigation and it is roughly a 30-mile trip to get to this field from the other side. I have decided that given the distance I would have to travel to get it Irrigated field, I am better off to move this right to land on the East side of the river.

40C 167389-00

This right has a May 12, 1969 priority date and this priority date is probably correct. It is currently listed at 1.82 CFS but was served by the same 10" Crisafulli pump driven by a 4020, 95 hp pto pump that was used on 40C 167387-00. The pump was rated at 3,500 GPM at 12' of lift. The claim was originally for 48 acres but was reduced to 37 in the Water Courts. Because the priority date was 1969 and the WRS for Rosebud County is July of 1948 there is no mention of this system in the Survey. The examination Aerials from I believe 1980 clearly show the place of use being irrigated and most of the Google Earth images also show this as irrigated. In the 100 year plus flood the Musselshell River moved its channel a moved the entire Place of Use from the east side of the river to now all being on the west side of the river. Because of this and the deepening of the river channel not allowing crossing with equipment several attempts to

irrigate this parcel have been made but complete irrigation of entire parcel has been very difficult since 2011.

I have decided I must move this right to land east of the river even though the soils are excellent on the current place of use and the graded borders are still in place.

40C 19338-00

This right is for 35 acres in Section 32 and 33 and are irrigated with a 1,400 GPM pump and level border dikes. The 1948 WRS shows diversion and ditches but says not in use. I'm not sure about the survey's conclusions but I do know that it appears that it was used constantly many years back. From my discussions and research, the pump was likely a 6" Crisafulli regular lift pump driven by a 540 PTO on a 706 International Pump. The equipment was gone when I bought the place. 20' of lift that would generate the 1400 GPM Decreed.

Unfortunately, the 2011 100-year flood took the route of the ditch for this water right and the channel of the Musselshell River is now where the ditch was. This moved the entire place of use to the Southwest of the river when it use to be on the North east. I have made some attempts to figure out how to irrigate the place of use but given the deepening of the channel, ownership of the route into the land now south of the river it would be very difficult to irrigate this and moving the place of use to land east of the river is my only option. Several attempts have been made to work with the NRCS, but they studied and found that moving it is the only option we have. Mr. Kincheloe as well as I having been working on this since the flood.

40C 167385-00

This right is my most senior right that covers 45 acres near my house in section 29. This water right shows up on the Rosebud County WRS the point of diversion is correct but I plan on removing the 4.4-acre parcel on the north west of this irrigation project. This POD has electrical service at the pump site and will be the only POD on my proposed change.

40C 167386-00

This right has 3 pods listed but from my research only POD #2 was used. This right covered 16 acres adjoining the POU of water right 40C 19338-00 and used the same ditch as 19338-00. Unfortunately, like 40C 19338-00 the ditch that served this right in the flood of 2011, became the new Musselshell River and moved all of the POU to the south and west of the river. Like 40C 19338-00 the river erode and made much deeper there is no way to cross it and I must move the acres and right to the North and east side of the river so that I can farm and use equipment on land.

Many attempts were made by my predecessors to put all the irrigation back in production, unfortunately with the movement and deepening of the river most efforts have failed. When I bought this place 3 years ago I at first thought I could just get all the fields back in production without moving any rights. That has proven to not be the case, and this change application is the only way I can get the feed production I need for this ranch back into full production.

Boyd change application for change details

Rights Involved:

40C 167385-00	10/1/1908	1.71 CFS	45 ACRES	4.4 ACRES MOVED
40C 167386-00	10/1/1908	273.77 GPM	16 ACRES	ALL MOVED
40C 19338-00	12/31/1947	3.12 CFS	35 ACRES	ALL MOVED
40C 167387-00	7/13/1963	2.05 CFS	54 ACRES	ALL MOVED
40C 167389-00	5/12/1969	1.82 CFS	37 ACRES	ALL MOVED
		9.31 CFS	187 ACRES	
Proposed 187.6 acre		1,661.45 GPM (3.7 CFS)		

PLAN TO MOVE ALL PUMPING FOR 5 WATER RIGHTS TO SWSESE SECTION 29 TWP 12N RGE 31E ROSEBUD CNTY.

PUMPING WILL BE COMPLETED WITH TWO MANIFOLDED PUMPS. 1 IS A 4RB-40-3.4 CORNELL PUMP AND 4HH CORNELL PUMP. COMBINED THEY WILL DIVERT 1,661.45 GPM OR 2.97 CFS TO IRRIGATE 187.6 ACRES. WATER RIGHT 40C 167388-00 WILL CONTINUE TO IRRIGATE THE PLACE OF USE OF THE 45 ACRE PIVOT EACH SPRING.

PUMPS WILL BE REMOVEABLE BECAUSE OF FLOOD HAZARDS AND STREAM BANK INSTABILITY. ELECTRICAL SERVICE ALREADY EXISTS AND IDENTIFIED POD.

September 26, 2025

Paul and Natalie Boyd
PO Box 188
Melstone, MT 59054

Subject: Completed Technical Analysis for Change Prepplication No. 40C 30170690

Dear Applicant,

As designated on the submitted Preapplication Meeting Form per §85-2-302(3)(b), MCA, the Department of Natural Resources and Conservation (DNRC or Department) has completed the technical analyses for Change Prepplication No. 40C 30170690 based on the information provided in your Preapplication Meeting Form accepted by the Department on July 1, 2025. The technical analyses can be found in the attached report. Please note, this Change Technical Analyses Report is a two-part publication, comprised of a Part A completed by Chris Schweigert, Billings Regional Office and a Part B completed by Jack Landers, Water Sciences Bureau.

This Technical Analyses Report **IS**: A collection of facts that the DNRC has gathered, including content provided in the Preapplication Meeting Form materials. The Department will use these data to analyze the criteria in §85-2-402, MCA if you submit an application for the project described in the completed Preapplication Meeting Form.

This Technical Analyses Report **IS NOT**: An analysis or discussion of whether the Preapplication Meeting Form as filed meets the criteria (§85-2-402, MCA).

You have 180 days to submit the Water Right Change Application Form 606 considering the information provided in the technical analyses and Preapplication Meeting Form. If the Application Form is not submitted to the Billings Regional Office by **March 26, 2026**, a new preapplication meeting will be required to process the Application with expedited timelines (ARM 36.12.1302(6)(b)). If any details described in the submitted Application are changed from that of the submitted Preapplication Meeting Form, the discounted filing fee and expedited timelines will not

apply (ARM 36.12.1302(6)(a)). Please note that the technical analyses will expire one year from the date of this letter (ARM 36.12.1302(8)).

Please let me know if you have any questions.

Sincerely,

Christine Schweigert
Hydrologist
Billings Regional Office
cschweigert@mt.gov
406-247-4419
1371 Rimtop Drive, Billings, MT 59105

CC: Pat Riley

2ei

Surface Water Change Technical Analyses Report – Part A

Department of Natural Resources and Conservation (DNRC or Department)
Water Resources Division
Chris Schweigert, Hydrologist, Billings Regional Office

Application No.	40C 30170690	**Proposed Point of Diversion**	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29. T12N, R31E, Rosebud County
Applicant	Paul and Natalie Boyd		

Overview

This report is Part A of a two-part publication which analyzes data submitted by the Applicant in support of the above-mentioned water right application. This report provides technical analyses as required under the Administrative Rules of Montana (ARM) 36.12.1303 in support of the water rights criteria assessment as required in § 85-2-402 Montana Code Annotated (MCA).

This Surface Water Change Technical Analyses Report – Part A contains the following sections:

1.0 Application Details

The Applicant proposes to change the points of diversion (POD) and places of use (POU) for Statements of Claim numbers 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389, and 40C 19338-00. The proposed POU is located in the NE and S2 Sec. 29, and the NW and N2N2SW Sec. 28, T12N, R31E. The project is in Rosebud and Petroleum Counties, and the source is the Musselshell River.

Table 1. Water Rights Proposed for Change

Water Right Number	Flow Rate (CFS)	Volume	Purpose/ Acres	Period Of Use	Place Of Use	Point(s) Of Diversion	Priority Date
40C 167385-00	1.71	Amount put to historical and beneficial use	Irrigation 45 AC	5/1 to 10/15	W2NESE, NWSE, NWSESE, and E2NESW Sec. 29, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E, Rosebud County	10/1/1908
40C 167386-00	0.61	Amount put to historical and beneficial use	Irrigation 16 AC	5/1 to 10/15	SWNENE, NWSENE, and SWSENE Sec. 32, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E; NWSWNW Sec. 33, T12N, R31E; NWSWNW Sec. 33, T12N, R31E, Rosebud County	10/1/1908
40C 167387-00	2.05	Amount put to historical and beneficial use	Irrigation 54 AC	5/1 to 10/15	SWNE, SENW, and NWSE Sec. 20, T12N, R31E, Petroleum County	NWNWSE Sec. 20, T12N, R31E, Petroleum County	7/13/1963
40C 167389-00	1.82	Amount put to historical and beneficial use	Irrigation 37 AC	5/1 to 10/15	S2NENW, SENWNW, N2SENW, and SWNW Sec. 29, T12N, R31E, Rosebud County	NESENW Sec. 29, T12N, R31E, Rosebud County	5/12/1969
40C 19338-00	3.12	115 AF	Irrigation 35 AC	5/1 to 9/30	NE Sec. 32, T12N, R31E, and W2NWNW Sec. 33, T12N, R31E, Rosebud County	SESENE Sec. 32, T12N, R31E, Rosebud County	12/31/1947

Figure 1. Map of the Applicant's historical and proposed POD on the source and the historical and proposed place of use.

2.0 Historical Use Technical Analysis

2.1 Historical Field Consumed and Applied Volumes

The consumed volume for irrigation is based on the net irrigation requirement (NIR) from USDA Natural Resources Conservation Service Irrigation Water Requirements (IWR) at a representative weather station. The NIR is multiplied by a county-wide management factor (from ARM 36.12.1902) to produce an adjusted NIR representative of actual crop yields in Montana. Crop consumption is determined by multiplying the adjusted NIR by the number of acres of irrigation. Crop consumption is then divided by the field efficiency identified from the irrigation method and ARM 36.12.115. Irrecoverable losses (IL) are 5% of the field applied volume for flood irrigation or 10% for sprinkler irrigation. The total consumed volume for irrigation is the crop consumption plus irrecoverable losses. The total non-consumed volume is the field applied volume minus the total consumed volume.

Statement of Claim 40C 167385-00

USDA aerial photo no. 278-21 dated 9/14/1979, and 478-87 dated 7/21/1980 show 45 acres irrigated within the claimed place of use for Statement of Claim 40C 167385-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 45 acres irrigated within the claimed place of use for Statement of Claim 40C 167385-00.

The Applicant hasn't provided any information to substantiate the flow rate. The flow rate for this claim was reduced from 5 CFS to 1.71 CFS by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination irrigation standard of 17 GPM/AC for 16 acres. The flow rate of 1.71 CFS was maintained on the Reexamined version of Statement of Claim 40C 167385-00.

Statement of Claim 40C 167385-00 has been historically used to flood irrigate 45 acres with a priority date of October 1, 1908, from the Musselshell River using a pump in the SWSESE Sec. 29, T12N, R31E, Rosebud County at 1.71 CFS from May 1 to October 15. The place of use includes 6 acres in the W2NESE, 21 acres in the NWSE, 3 acres in the NWSESE, and 15 acres in the E2NESW Sec. 29, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field application volumes have been calculated with the inputs shown in Table 2 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 2. Historical use for Statement of Claim 40C 167385-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	45	23.18	0.477	0.6	41.46	3.46	44.92	69.11

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167386-00

USDA aerial photos no. 278-21 and 278-29 dated 9/14/1979, show 16 acres irrigated within the claimed place of use for Statement of Claim 40C 167386-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 16 acres irrigated within the claimed place of use for Statement of Claim 40C 167386-00.

The Applicant hasn't provided any information to substantiate the flow rate. The flow rate for this claim was reduced from 5 CFS to 273.77 GPM (0.61 CFS) by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination irrigation standard of 17 GPM/AC for 16 acres. The flow rate of 273.77 was maintained on the Reexamined version of Statement of Claim no. 40C 167386-00.

Statement of Claim 40C 167386-00 has been used historically to flood irrigate 16 acres with a priority date of October 1, 1908, from the Musselshell River using a pump in the SWSESE Sec. 29, a pump in the NWSWNW Sec. 33, and a pump in the NWSWNW Sec. 33, T12N, R31E, Rosebud County at 273.77 GPM from May 1 to October 15. The place of use includes 2 acres in the SWNENE, 10 acres in the NWSENE, and 4 acres in the SWSENE Sec. 32, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field application volumes have been calculated with the inputs shown in Table 3 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 3. Historical use for Statement of Claim 40C 167386-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	16	23.18	0.477	0.6	14.74	1.23	15.97	24.57

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167387-00

USDA aerial photo no. 478-87 dated 7/21/1980, shows 54 acres irrigated within the claimed place of use for Statement of Claim 40C 167387-00.

Water Resources Survey photo MA-29 160 dated circa 1944 shows 54 acres irrigated within the claimed place of use for Statement of Claim 40C 167387-00.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 10-inch Crisafulli regular lift pump driven by a 540 power-take-off (PTO) of a 4020 John Deere tractor. The pump curve for a 10-inch Crisafulli pump indicates that the pump has a capacity of 7.79 CFS, 4.04 CFS greater than the claimed 3.75 CFS. The flow rate for this claim was reduced

to 2.05 CFS by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination, irrigation standard of 17 GPM/AC for 54 acres.

Statement of Claim 40C 167387-00 has been used historically to flood irrigate 54 acres with a priority date of July 13, 1963, from the Musselshell River using a pump in the NWNWSE Sec. 20, T12N, R31E, Petroleum County at 2.05 CFS from May 1 to October 15. The place of use includes 22 acres in the SWNE, 22 acres in the SENW, and 10 acres in the NWSE Sec. 20, T12N, R31E, Petroleum County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field applied volumes have been calculated with the inputs shown in Table 4 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 4. Historical Use for Statement of Claim 40C 167387-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	54	23.18	0.477	0.6	49.76	4.15	53.90	82.93

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167389-00

USDA aerial photo nos. 278-21 dated 9/14/1979, and 478-87 dated 7/21/1980, show 37 acres irrigated within the claimed place of use for Statement of Claim 40C 167389-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 37 acres irrigated within the claimed place of use for Statement of Claim 40C 167389-00.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 10-inch Crisafulli regular lift pump driven by a 540 power-take-off (PTO) of a 4020 John Deere tractor. The same pump was used for Statement of Claim 40C 167387-00. The pump curve for a 10-inch Crisafulli pump indicates that the pump has a capacity of 7.79 CFS.

A Master's Report filed November 17, 1982, and adopted December 21, 1992, explains that the claimed flow rate of 130 CFS and volume of 240 AF for irrigation of 48 acres were changed by DNRC during claims examination according to the Montana Supreme Court Rules for Claims Examination. The Department changed the flow rate to 1.82 CFS based on the standard of 17 GPM per acre for 48 acres. The volume was removed and replaced with a standard remark limiting the volume to the amount put to historical and beneficial use. The acreage was reduced to 37 acres based on verified acres found during the claim examination. The flow rate was not reduced with the acreage and is equal to 22.1 GPM per acre.

A memorandum in the file dated January 20, 2004, from Jim Gilman, DNRC, to Bruce Loble, Chief Water Judge, explains that standards were run for basin 40C and that several Statements of Claim, including 40C 167389-00, did not conform to standards and that the flow rate for 40C

167389-00 should be reduced to 1.4 CFS which would equate to 17 GPM per acre for 37 acres. At this time, that change has not been made to Statement of Claim 40C 167389-00 and the flow rate remains 1.82 CFS.

Statement of Claim 40C 167389-00 has been use historically to flood irrigate 37 acres with a priority date of May 12, 1969, from the Musselshell River using a pump in the NESENW Sec. 29, T12N, R31E, Rosebud County at 1.82 CFS from May 1 to October 15. The place of use includes 7 acres in the S2NENW, 3 acres in the SENWNW, 8 acres in the N2SENW, and 19 acres in the SWNW Sec. 29, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field applied volumes have been calculated with the inputs shown in Table 5 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 5. Historical Use for Statement of Claim 40C 167389-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	37	23.18	0.477	0.6	34.09	2.84	36.93	56.82

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 19338-00

USDA aerial photo no. 278-21 dated 9/14/1979, shows 35 acres irrigated within the claimed place of use for Statement of Claim 40C 19338-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 35 acres irrigated within the claimed place of use for Statement of Claim 40C 19338-00.

A Master's Report filed April 21, 1992, adopted May 12, 1992, explains that Statement of Claim 40C 19338-00 was filed for a flow rate of 1,400 GPM by means of a pump from the Musselshell River and a volume of 115 AF per year for the irrigation of 50 acres in Sec. 32 and 33, T12N, R31E. It further explains that the claimed acres were changed by DNRC during claims examination according to the Montana Supreme Court Rules for Claims Examination. The acreage was reduced from 50 acres to 35 acres based on verified acres found on USDA aerial photo no. 378-242 dated 1979, during the claim examination. The flow rate, 1,400 GPM, was not reduced with the acreage, is based on the pump capacity, and is equal to 40 GPM per acre. After the Master's Report was adopted, a volume remark was added to Statement of Claim 40C 19338-00 which says, "The Water Court has determined that a volume quantification is required to adequately administer this right." The Applicant has chosen to use the Department method for calculating the historical diverted and consumed volumes as shown in Table 6 below.

A Master's Report filed February 18, 2020, adopted April 17, 2020, explains the claims included in Case 40C-R258, including 40C 19338-00, filed November 27, 2019, received a late objection during the adjudication of the Basin 40C Temporary Preliminary Decree from Marion and Leo Collier. Because the late objection was not previously resolved, an issue remark was placed on

the claim. The objection was based on ownership, but the objectors passed away before the Water Court addressed the issue. The objection was dismissed, and the issue remark was removed from the claim.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 1,400 GPM pump to level border dikes. The Applicant's affidavit states the historical pump was a 6-inch Crisafulli regular lift pump driven by a 540 PTO on a 706 International tractor. Based on 20 feet of lift, the 6-inch Crisafulli would generate the 1,400 GPM flow rate claimed.

Statement of Claim 40C 19338-00 has been used historically to irrigate 35 acres under a wheeline sprinkler with a priority date of December 31, 1947, from the Musselshell River using a pump in the SESENE Sec. 32, T12N, R31E, Rosebud County at 3.12 CFS from May 1 to September 30. The place of use includes 30 acres in the NE Sec. 32, and 5 acres in the W2NWNW Sec. 33, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage. Statement of Claim 40C 19338-00 is a multiple use right with Statement of Claim 40C 19336-00. These claims are multiple uses of the same right. The use of this water for several purposes does not increase the extent of the water right. Rather it decrees the right to alternate and exchange the use (purpose) of the water in accordance with historical practices. Statement of Claim 40C 19336-00 is for 100 GPM for domestic use year-round for 4 households and up to 1.5 acres.

The Applicant has chosen to use the Department method to calculate the historical field applied and consumed volumes. The historical consumed and field applied volumes have been calculated with the inputs shown in Table 6 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 6. Historical Use for Statement of Claim 40C 19338-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Sprinkler	35	23.18	0.477	0.7	32.25	4.61	36.86	46.07

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Summary of Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 Proposed for Change

The following table is a summary of the historical use for all of the water rights proposed for change.

Table 7. Summary of Historical Use for all Statements of Claim Proposed for Change

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)

Sprinkler	35	23.18	0.477	0.7	32.25	4.61	36.86	46.07
Flood	152	23.18	0.477	0.6	140.05	11.68	151.72	233.43
Total	**187**				**172.3**	**16.28**	**188.58**	**279.49**

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

2.2 Historical Conveyance Losses

There are no historical conveyance losses considered for the historical use of Statement of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 because water was diverted directly to the places of use by pumps.

2.3 Historical Diverted Volume

Per ARM 36.12.1902(10), the historically diverted volume is equal to the sum of the historical field application volume and historical conveyance loss volume. Because there are no conveyance losses attributabed to any of the water rights proposed for change, the historical diverted volume is equal to the historical field applied volume.

Table 8. Historically Diverted Volume of Water Rights Proposed for Change

Water Right No.	Field Application Volume (AF)	Conveyance Loss Volume (AF)	Historical Diverted Volume (AF)
40C 167385-00	69.11	0	69.11
40C 167386-00	24.57	0	24.57
40C 167387-00	82.93	0	82.93
40C 167389-00	56.82	0	56.82
40C 19338-00	46.07	0	46.07
Total	**279.5**	**0**	**279.5**

2.4 Summary of Historical Use

The Department will consider the following values when evaluating the historical use of Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 for the adverse effect criterion:

Table 9. Summary of historical use for Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00

Water Right No.	Historical Purpose	Maximum Historical Acres	Historical Place of Use	Historical Point of Diversion	Maximum Historical Flow Rate	Historically Consumed Volume (AF)	Historically Diverted Volume (AF)
40C 167385-00	Irrigation	45	W2NESE, NWSE, NWSESE, and E2NESW Sec. 29, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E, Rosebud County	1.71 CFS	41.46	69.11

40C 167386-00	Irrigation	16	SWNENE, NWSENE, and SWSENE Sec. 32, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E; NWSWNW Sec. 33, T12N, R31E; NWSWNW Sec. 33, T12N, R31E, Rosebud County	0.61 CFS (273.77 GPM)	14.74	24.57
40C 167387-00	Irrigation	54	SWNE, SENW, and NWSE Sec. 20, T12N, R31E, Petroleum County	NWNWSE Sec. 20, T12N, R31E, Petroleum County	2.05 CFS	49.76	82.93
40C 167389-00	Irrigation	37	S2NENW, SENWNW, N2SENW, and SWNW Sec. 29, T12N, R31E, Rosebud County	NESENW Sec. 29, T12N, R31E, Rosebud County	1.82 CFS	34.09	56.82
40C 19338-00	Irrigation	35	NE Sec. 32, T12N, R31E, and W2NWNW Sec. 33, T12N, R31E, Rosebud County	SESENE Sec. 32, T12N, R31E, Rosebud County	3.12 CFS	32.25	46.07

3.0 Analysis of Impacted Surface Water Sources

3.1 Summary of Proposed Use

The Applicant proposes using Statement of Claim nos. 40C 167385-00, 40C 167386-00, 40C167387-00, 40C 167389-00, and 40C 19338-00 as shown in Table 10:

Table 10. Summary of the proposed use of 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00

Water Right No.	Proposed Purpose	Proposed Acres	Proposed Place of Use	Proposed Point of Diversion	Proposed Flow Rate	Proposed Consumptive Volume (AF)	Proposed Diverted Volume (AF)
40C 167385-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29, T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	1.71 CFS	41.46	69.11
40C 167386-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29, T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.61 CFS (273.77 GPM)	14.74	24.57

40C 167387-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29, T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	1.38 CFS	49.76	82.93
40C 167389-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29, T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.00 CFS	34.09	56.82
40C 19338-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29, T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.00 CFS	32.25	46.07

Following the procedures outlined in the Historical Use section 2.1 above, the proposed consumed and diverted but non-consumed volumes have been calculated with the inputs shown in Table 11 following the methods described above and in ARM 36.12.1902. Per MCA 85-2-102(7)(b), a change in appropriation right does not include a change in method of irrigation (method of irrigation is also not an element that can be proposed for change). Thus, when calculating the proposed consumed and diverted volumes for a change, the Department will consider a change in the method of irrigation only on newly irrigated acreage, outside of the historically irrigated footprint.

Table 11. Proposed new irrigation inside and outside of the historical place of use.

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor	Field Efficiency	Crop Consumption (AF)	Field Application Volume (AF)	IL (AF)	Total Consumptive Volume (AF)	Non-Consumptive Volume (AF)
Flood (Inside Historical POU)	40.4	23.18[1]	0.477[3]	0.6	37.22	62.04	3.1	40.33	21.71
Pivot (Outside Historical POU)	146	25.83[2]	0.727[4]	0.9	228.47	253.86	25.39	253.86	0[5]
Total	186.4	-	-	-	265.7	315.90	-	294.18	21.71

[1]Ingomar IWR Weather Station – Flood Irrigation, Wheeline & Handline Seasonal ET inches
[2]Ingomar IWR Weather Station – Center Pivot Irrigation Seasonal ET inches
[3]Rosebud County Historical Use Management Factor 1964-1976 (Pre-July 1, 1973)
[4]Rosebud County Proposed Use Management Factor 1997-2006 (Proposed Use)
[5]Proposed use is 100% consumptive due to 90% efficient sprinkler irrigation and 10% irrecoverable losses

Table 12. Comparison of volumes associated with historical and proposed use.

Purpose	Historically Consumed Volume	Proposed Consumptive Volume	Historically Diverted Volume	Proposed Diverted Volume
Irrigation	188.58	294.18	279.49	315.90

3.2 Impacted Surface Water Sources

The Department has considered an area of potential adverse effect on the Musselshell River. This reach was determined by accounting for the location of the proposed and historical points of diversion and the proposed reduction in return flow as described in Part B. This reach extends from the SESENE Sec. 32, T12N, R31E, downstream to the S2NWSW Sec. 8, T12N, R31E, Rosebud County.

There are 15 water rights within the area of potential adverse effect, as illustrated in Appendix A.

Review

This document has been reviewed by the Department on September 25, 2025.

References

Department Standard Practice for Determining Historical Use
Department Standard Practice to Analyze Return Flows
Water Right Claim Examination Rules Amended by the Montana Supreme Court – Effective December 5, 2006.

Appendix A: Water Rights within the Area of Potential Adverse Effect

Water Right No.	Owner Name	Purpose	Period of	Flow Rate	Volume
40C 30008850	MONTANA, STATE OF DEPT OF FISH WILDLIFE & PARKS	FISHERY	01/01 to 12/31	70 CFS	50674.23
40C 20166200	JUSTIN KINCHELOE; YOHNA PFLUGHOFT	STOCK	01/01 to 12/31		0.00
40C 70691 00	KIMBERLY A MAXWELL; THOMAS A MAXWELL; MAXWELL, KIMBERLY A LIVING TRUST	STOCK	10/01 to 04/30	40 GPM	3.50
40C 167386 00	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	273.77 GPM	0.00
40C 167385 00	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	1.71 CFS	0.00
40C 167387 00	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	2.05 CFS	0.00
40C 19336 00	BAILEY RITCHEY; JESSE RITCHEY	DOMESTIC	01/01 to 12/31	100 GPM	7.00
40C 19337 00	NATALIE C BOYD; PAUL J BOYD; BAILEY RITCHEY; JESSE RITCHEY	IRRIGATION	05/01 to 09/30	3.12 CFS	0.00
40C 19338 00	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 09/30	3.12 CFS	115.00
40C 167389 00	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	1.82 CFS	0.00
40C 30141917	USA (DEPT OF INTERIOR BUREAU OF LAND MGMT)	STOCK	01/01 to 12/31		0.00
40C 30141928	USA (DEPT OF INTERIOR BUREAU OF LAND MGMT)	STOCK	01/01 to 12/31		0.00
40C 200296 00	ALLAN MCDANIEL	IRRIGATION	04/01 to 10/04	350.06 GPM	0.00
40C 201663 00	YOHNA PFLUGHOFT	IRRIGATION	05/01 to 10/01	1.13 CFS	0.00
40C 30008437	ALLAN MCDANIEL; YOHNA PFLUGHOFT	STOCK	01/01 to 12/31		5.1

Surface Water Change Technical Analyses Report - Part B

The Montana Department of Natural Resources and Conservation (DNRC) Water Resources Division

Jack Landers, Groundwater Hydrologist, Water Sciences Bureau (WSB)

Applicant Name	Paul and Natalie Boyd
Application No.	40C 30170690
Point of Diversion Legal Land Description	Township 12 North, Range 31 East, Rosebud and Petroleum Counties

Overview

This report is Part B of a two-part publication which analyzes data submitted by the Applicant in support of the above-mentioned water right change application. This report provides technical analyses as required under the Administrative Rules of Montana (ARM) 36.12.1303 in support of the water rights criteria assessment as required in §85-2-402, Montana Code Annotated (MCA). For applications in closed basins, this report fulfills the requirements of MCA §85-2-361.

This Surface Water Change Technical Analyses Report – Part B contains the following sections:

1.0 Executive Summary

Application Details

The Applicant proposes to change the point of diversion (POD) and place of use (POU) for Statement of Claim Nos. 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00. The water rights proposed for change were historically used to irrigate 187.0 acres with water diverted from the Musselshell River at several PODs listed in **Table 1**. The water rights were not used supplementally, and each water right delivered the full irrigation demand to one of five fields shown in **Figure 1**. The Applicant proposes to retire 146.6 acres, add 146.0 acres of irrigation outside the historical POU, and continue to irrigate 40.4 acres within the historical POU for a total of 186.4 acres. The proposed acres outside the historical POU would be irrigated with a center-pivot sprinkler system with water diverted from the Musselshell River using two transitory pumps. All five water rights proposed for change would be used supplementally on the proposed POU.

Table 1: Water rights proposed for change.

Water Right No	Flow Rate (cfs)	Period of Diversion	Point of Diversion
40C 167385-00	1.71	5/1-10/15	SWSESE Section 29, T12N R31E, Rosebud County
40C 167386-00	0.61	5/1-10/15	SWSESE Section 29, T12N R31E, Rosebud County
40C 167387-00	2.05	5/1-10/15	NWNWSE Section 20, T12N R31E, Rosebud County
40C 167389-00	1.82	5/1-10/15	NESENW Section 29, T12N R31E, Rosebud County
40C 19338-00	3.12	5/1-9/30	SESENE Section 32, T12N R31E, Rosebud County

3.0 Adverse Effect – Return Flow Analysis

3.1. Consumed & Non-Consumed Volume

The consumed volume for irrigation is based on the net irrigation requirement (NIR) from USDA Natural Resources Conservation Service Irrigation Water Requirements (IWR) at a representative weather station. The NIR is multiplied by a county-wide management factor (from ARM 36.12.1902) to produce an adjusted NIR representative of actual crop yields in Montana. Crop consumption is determined by multiplying the adjusted NIR by the number of acres of irrigation. Crop consumption is then divided by the field efficiency identified from the irrigation method and ARM 36.12.115. For proposed irrigation that falls outside of the historical place of use, the Applicant has requested a field efficiency of 90%, which falls outside of the standards found in ARM 36.12.115. Deviations such as this are permissible but require supporting information from the Applicant at the time of application. Irrecoverable losses (IL) are 5% of the field applied volume for flood irrigation or 10% for sprinkler irrigation. The total consumed volume for irrigation is the sum of crop consumption and irrecoverable losses. The total non-consumed volume is the field applied volume minus the total consumed volume.

The historical and proposed consumed and non-consumed volumes have been calculated with the inputs shown in **Table 2** and **Table 3** following the methods described above and in ARM 36.12.1902.

Table 2: Historical use.

Water Right No. / Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	Applied Volume (AF)	IL (AF)	Total Consumed Volume (AF)	Non-Consumed Volume (AF)
40C 167385-00 / Flood	45.0	23.18	47.7%	60%	41.46	69.11	3.46	44.92	24.19
40C 167386-00 / Flood	16.0	23.18	47.7%	60%	14.74	24.57	1.23	15.97	8.60
40C 167387-00 / Flood	54.0	23.18	47.7%	60%	49.76	82.93	4.15	53.90	29.03
40C 19338-00 / Wheel line	35.0	23.18	47.7%	70%	32.25	46.07	4.61	36.86	9.21
40C 167389-00 / Flood	37.0	23.18	47.7%	60%	34.09	56.82	2.84	36.93	19.89
Total	187.0	-	-	-	172.30	279.50	16.29	188.58	90.92

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor

Table 3: Proposed use.

Type / Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor	Field Efficiency	Crop Consumption (AF)	Applied Volume (AF)	IL (AF)	Total Consumed Volume (AF)	Non-Consumed Volume (AF)
Within historical POU[2] / Flood	40.4	23.18	47.7%	60%	37.22	62.04	3.10	40.33	21.71
Outside historical POU[3] / Sprinkler	146.0	25.83	72.7%	90%	228.47	253.86	25.39	253.86	0.00
Total	186.4	-	-	-	265.69	315.90	28.49	294.19	21.71

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor
[3]Rosebud County Proposed Use Management Factor

3.2 Hydraulically Connected Surface Water(s)

Potentially affected surface waters in a return flow evaluation are identified by their hydraulic connection, both direct and indirect, to the aquifer below the irrigation place of use. Hydraulic connection depends on the depth to groundwater beneath the beds of surface waters, connection between deep and overlying shallow aquifers, vertical gradients, and can vary along a reach and with time of year.

Procedures for evaluating hydraulic connection and identifying one or more potentially affected surface water(s) for can be found in DNRC (2019). Following protocols in DNRC (2019) **Table 4** identifies published information used to assess hydraulically connected surface water(s). Not all data may be available for each project and is noted as "NA" when that occurs.

As shown in **Figure 1**, the historical and proposed POUs overlie unconsolidated alluvial sediments adjacent to the Musselshell River. The relatively thin alluvial sediments overlie the Bearpaw shale. Numerous ephemeral or intermittent streams drain upland areas surrounding the Musselshell River in the vicinity of the proposed project. These streams exhibit similar characteristics and have been grouped into east and west tributaries in **Table 4**, reflecting their position relative to the Musselshell River. The Musselshell River was also evaluated for hydraulic connection to groundwater (**Table 4**).

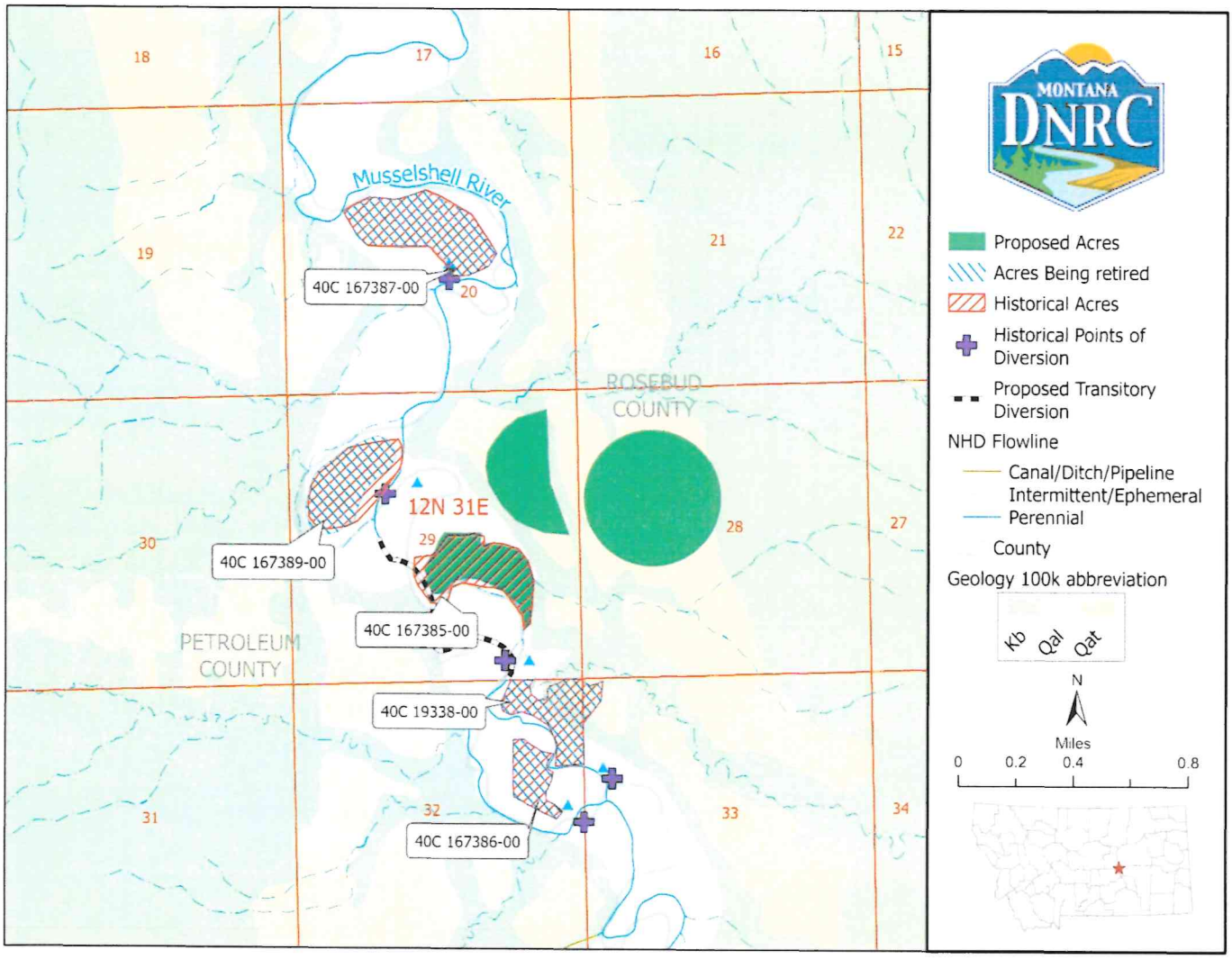

Figure 1: Overview of the proposed project. The Musselshell River flows north and is the boundary between Petroleum and Rosebud County. Individual fields within the historical POU are labeled with the corresponding water right.

WSB Technical Analysis Findings

Based on information submitted, the WSB quantified the historical non-consumed volume and location of historical return flows. These analyses are in support of the following criteria assessment: adverse effect. A summary of WSB findings described in subsequent sections are listed below.

TECHNICAL ANALYSES FINDINGS

ADVERSE EFFECT (RETURN FLOWS)	The historical non-consumed volume is 90.92 acre-feet (AF) and the location of historical return flows as identified in **Figure 2** is to the Musselshell River downstream of the western boundary of the NWSWNW Section 33, Township 12 North, Range 31 East, Rosebud County. The proposed non-consumed volume is 21.71 AF and the location of proposed return flows as identified in **Figure 2** is to the Musselshell River beginning at the northern boundary of the SESWSE Section 29, Township 12 North, Range 31 East, Petroleum County.

2.0 Methodology

DNRC will analyze the change to determine if:

a. Return flows will enter back into the source where they have historically returned upstream of or at the location of the next downstream appropriator; or,
b. Water is left instream so historically diverted flows are available during the historical period of diversion either below the point of diversion or where return flows historically returned to the source.

If neither criterion is met or return flows accrete to more than one source, the return flow analysis may include a monthly breakdown of the rate and timing of return flows and evaluate impacts to the identified rights.

Return flows are evaluated by determining the volume of water that infiltrates past the root zone and identifying the likely receiving stream(s). The assumption is made that water applied for irrigation that is not consumed by a crop infiltrates to groundwater becoming return flow and does not run off. The amount of water not consumed is the difference between the amount of water consumed and the amount of water applied to a field. The receiving stream is determined by proximity and evidence of hydraulic connection to groundwater and generally does not depend on groundwater flow direction or land slope (Leake, 2011).

Historical consumed volumes for irrigation are calculated following the procedures described in DNRC consumptive use rules in ARM 36.12.1902. The amount of water consumed at the field is equal to crop consumption plus irrecoverable losses calculated as a percent of applied amounts. The amount of water applied to a field is determined from estimates of application efficiency and crop consumption. The amount of water not consumed is the difference between the amount of water consumed and the amount of water applied to a field.

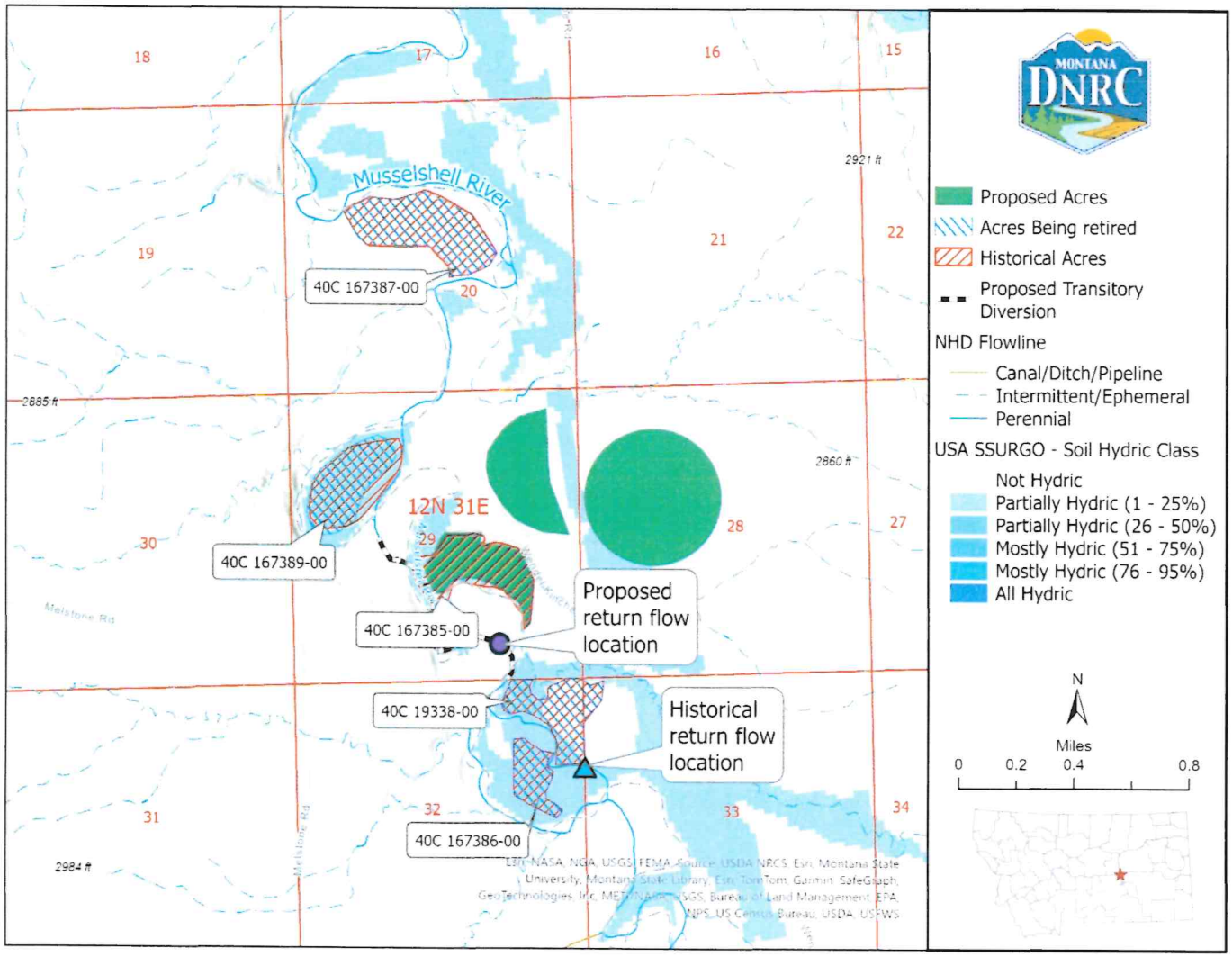

Figure 2: Location of historical and proposed irrigation and return flows.

WSB Findings

Based on the review of the published information in **Table 4**, the Musselshell River is the nearest hydraulically connected surface water source (**Figure 2**) and the receiving stream for historical and proposed return flows.

3.3 Location of Return Flows

Historical return flows total 90.92 AF from 187.0 acres of irrigation. The starting point of return flows would be on the Musselshell River downstream of the western boundary of the NWSWNW Section 33, Township 12 North, Range 31 East, Rosebud County (**Figure 2**).

Under the proposed change, return flows would be equal to 21.71 AF from 40.4 retained historical acres of irrigation and would accrue to the Musselshell River beginning at the northern boundary of the SESWSE Section 29, Township 12 North, Range 31 East, Petroleum County (**Figure 2**).

Under the proposed change, return flows would enter back into the source where they have historically returned upstream of the next downstream appropriator. In addition, the Applicant would leave a portion of historical diverted non-consumed volume instream at the historical point of diversion. Therefore, an analysis of rate and timing of return flows was not conducted.

Historically, each field was irrigated under a separate water right, as shown in **Figure 2**. Under the proposed change, all five water rights would irrigate the entire proposed POU. The proposed return flow volume attributed to each water right was calculated by multiplying the proposed return flow volume by the proportion of individual flow rates to the total flow rate, shown in **Table 5**.

Table 5: Historical and proposed annual return flow volume attributed to the water rights proposed for change.

			Return Flow Volume (AF)	
WR Number	**Flow Rate (cfs)**	**Proposed Supplemental Proportion**	**Historical**	**Proposed**
40C 167385-00	1.71	0.18	24.19	3.99
40C 167386-00	0.61	0.07	8.60	1.42
40C 167387-00	2.05	0.22	29.03	4.78
40C 167389-00	1.82	0.20	19.89	4.24
40C 19338-00	3.12	0.34	9.21	7.28
Total	9.31	1.00	90.92	21.71

Review

This document has been reviewed on September 4, 2025 in accordance with Category 7 of DNRC's Water Sciences Bureau Minimum Standards of Review, Version 2, February 2024.

References

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Table 4: Published information used to identify hydraulically connected surface water(s).

Published Information	**Surface Water Source:** Musselshell River	**Surface Water Source:** East tributaries	**Surface Water Source:** West tributaries
USGS National Hydrographic Dataset (NHD)[1]	Perennial	Intermittent/ephemeral	Intermittent/ephemeral
USGS PROSPER Dataset[2]	0.74-0.76	0.04-0.35	0.05-0.24
MBMG GWIC wells, less than 50 ft deep, within 1,000 ft of surface water, static water levels above or within 10 ft of elevation of stream bed (DNRC, 2018)[3]	None[4]	None[4]	None[4]
Published Water Table Maps, Publications, Previous Water Rights, etc.[5]	None	None	None
Gridded National Soil Survey Geographic Database[6]	Hydric conditions along channel	Minimal hydric conditions along channel	Minimal hydric conditions along channel
Aerial imagery	Wet channel	Dry channel	Dry channel
Affidavits, photographs, etc.	None	None	None

[1] Review NHD to identify perennial, intermittent, and ephemeral classifications for surface water sources most proximal to the proposed diversion(s).

[2] USGS PROSPER probability of streamflow permanence (greater than 50 percent of the time it flows).

[3] Per DNRC (2019) hydraulic connection of individual stream reaches to ground water is evaluated by comparing streambed elevations to static groundwater elevations measured in MBMG GWIC wells less than 50 ft deep and within 1,000 ft of surface water or from published water table maps. Surface water within that area is considered hydraulically connected to the unconfined aquifer if static groundwater elevations are above or within 10 ft of the elevation of the stream bed.

[4] There is limited groundwater development within 1,000 ft of surface waters adjacent to the project area; therefore, lack of wells that meet these requirements does not offer evidence for or against connection to surface water.

[5] No water table maps available.

[6] Review Gridded National Soil Survey Geographic Database to identify hydric soils or shallow water tables near surface water sources.

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Q 9

MONTANA SAGE GROUSE HABITAT CONSERVATION PROGRAM

GREG GIANFORTE, GOVERNOR
STATE OF MONTANA
1539 ELEVENTH AVENUE
PO BOX 201601
HELENA, MONTANA 59620-1601
PHONE: (406) 444-0551
FAX: (406) 444-6721

Project No. 6998
Governor's Executive Orders 12-2015 and 21-2015
Boyd Ranch Irrigation Movement and Conversion

Patrick Riley
201 Canyon Road
Roundup, MT 59072

May 8, 2025

Dear Mr. Riley,

The Montana Sage Grouse Habitat Conservation Program received a request for consultation and review of your project or proposed activity on April 17, 2025. Additional information necessary for Program review was received on May 6, 2025. Based on the information provided, portions of this Project are located within either a Core Area or General Habitat for sage grouse. The Bureau of Land Management (BLM) classifies these areas as either a Priority Habitat Management Area (PHMA) or a General Habitat Management Area (GHMA).

Executive Orders 12-2015 and 21-2015 set forth Montana's Sage Grouse Conservation Strategy. Montana's goal is to maintain viable sage grouse populations and conserve habitat so that Montana maintains flexibility to manage our own lands, our wildlife, and our economy and ensure that a listing under the federal Endangered Species Act is not warranted in the future.

The Program has completed its review, including:

Project Description:

Project Type: Agriculture – Water
Project Disturbance: 1.46 Miles of Buried Utilities; Two Pivots Totaling 180.16 Acres
Construction Timeframes: July 16, 2025 to December 31, 2025; Short Term (<1 Year)
Operations Timeframe: January 1, 2026; Permanent (>25 Years)

Project Location:

Legal: Township 12 South, Range 31 East, Sections 28, 29
County: Petroleum, Rosebud
Ownership: Private

Executive Orders 12-2015 and 21-2015 Consistency:

The Boyd Ranch Irrigation Movement and Conversion Project proposes to install a new irrigation system located in both a designated Core Area and General Habitat for sage grouse.

A private landowner proposes to move and consolidate their existing irrigation system approximately 12 miles northeast of Melstone, Montana. See Figure 1 (Boyd Ranch Irrigation Movement and Conversion Project Location Map). The landowner's current irrigation system was damaged in a 2011 flood event. Due to these acres being located in the floodplain, the landowner is moving the irrigation system and consolidating irrigated acres outside of the floodplain to avoid further damage. An Application to Change a Water Right through the Department of Natural Resources and Conservation (DNRC) is required to complete this work.

This new irrigation system will include two currently irrigated fields and two new pivots. The two new pivots include one half and one full pivot totaling 180 acres of new pivot-irrigation. The land under the half-pivot has historically been flood-irrigated and the land under the full pivot has historically been farmed. The point of diversion for this new system will draw water from the Musselshell River.

To achieve this, water will be diverted from the Musselshell River through new, buried pipelines to all pivots. In addition to the pipeline and pivots, a buried power line will be installed within the same trench as the buried pipeline.

A backhoe will be used to dig the trenches for water pipeline and buried power line. Pivots will be installed with loaders. All disturbances associated with this Project will be reclaimed and reseeded with a Natural Resources Conservation Service (NRCS) recommended seed mix. Reclamation will occur in August 2025.

Based on the information you provided; the portion of your Project located in General Habitat is not within two miles of any active sage grouse lek. The portion of the Project in a Core Area is 2.72 miles from the nearest active sage grouse lek. See Figure 2 (Boyd Ranch Irrigation Movement and Conversion Project Lek Location Map).

The Project is anticipated to begin mid-July 2025. However, should Project activities begin prior to July 15, the landowner has voluntarily agreed not to conduct these activities between 4:00-8:00 am and 7:00-10:00pm between March 15 and July 15.

Discussion:

Exempt activities are identified in Executive Order 12-2015 (EO) as described in Attachment F. The activity described for the Boyd Ranch Irrigation Movement and Conversion (irrigation without conversion of sagebrush to newly irrigated land) is exempt from stipulations per Executive Order12-2015. Your proposed project or activity may need to obtain additional permits

or authorizations from other Montana state agencies or possibly federal agencies. They are very likely to request a copy of this consultation letter, so please retain it for your records.

Recommendations:

These stipulations are designed to maintain existing levels of suitable sage grouse habitat by managinguses and activities in sage grouse habitat to ensure the maintenance of sage grouse abundance and distribution in Montana. Development should be designed and managed to maintain populations and sage grouse habitats.

- Weed management is required within both Core Areas and General Habitat for sage grouse. Reclamation of disturbedareas must include control of noxious weeds and invasive plant species, including cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicas*).

Please be aware that if the location or boundaries of your proposed project or activity change in the future, or if new activities are proposed within one of the designated sage grouse habitat areas, please visit https://sagegrouse.mt.gov/ and submit the new information.

Thanks for your interest in sage grouse and your commitment to taking the steps necessary to ensure Montana's Sage Grouse Conservation Strategy is successful.

Sincerely,

Therese Hartman
Montana Sage Grouse Habitat Conservation Program Manager

Attachments:

Figure 1. Boyd Ranch Irrigation Movement and Conversion Project Location Map
Figure 2. Boyd Ranch Irrigation Movement and Conversion Project Lek Location Map

Figure 1

6998 - Boyd Ranch Irrigation Movement and Conversion
Project Location Map

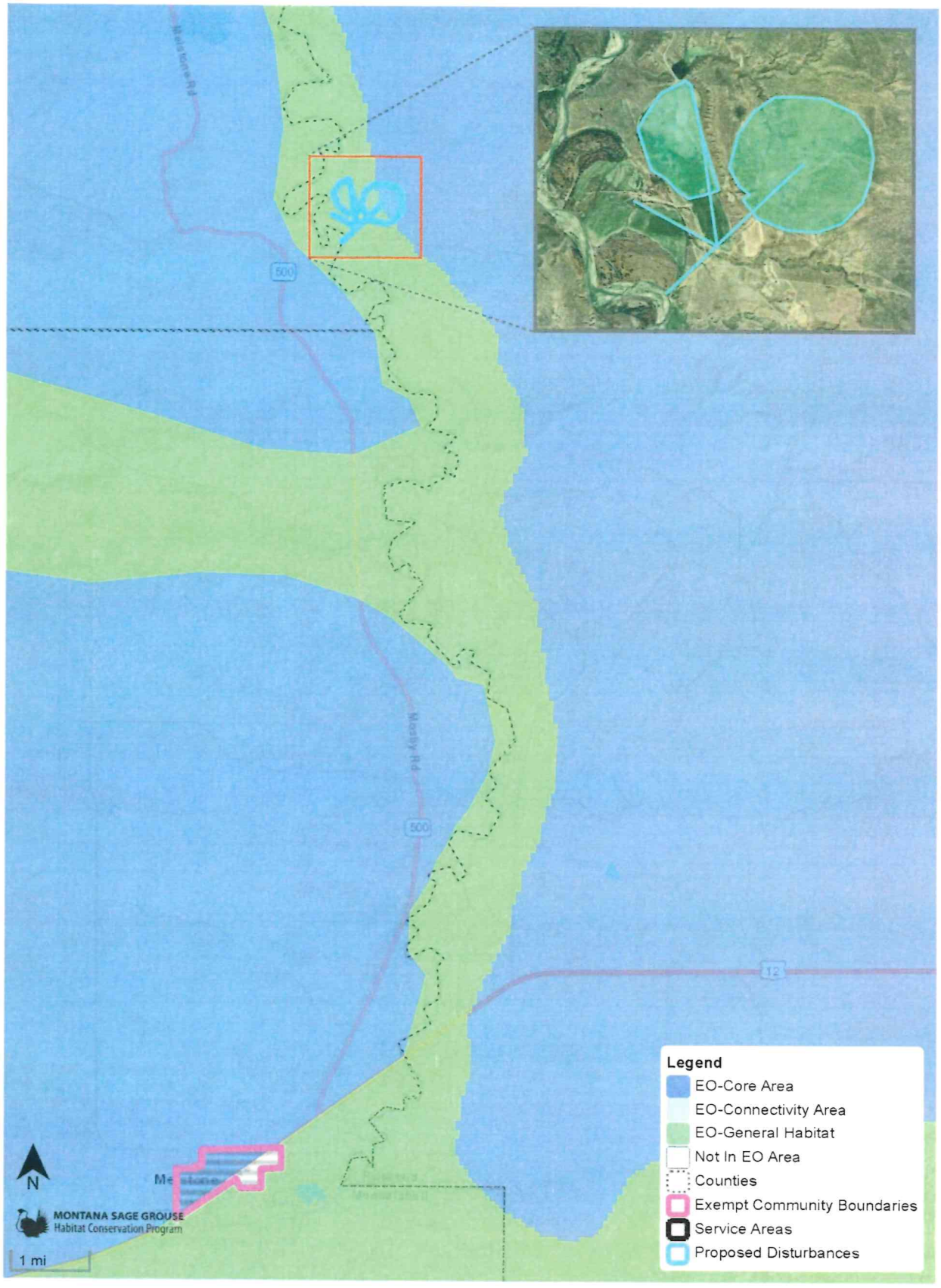
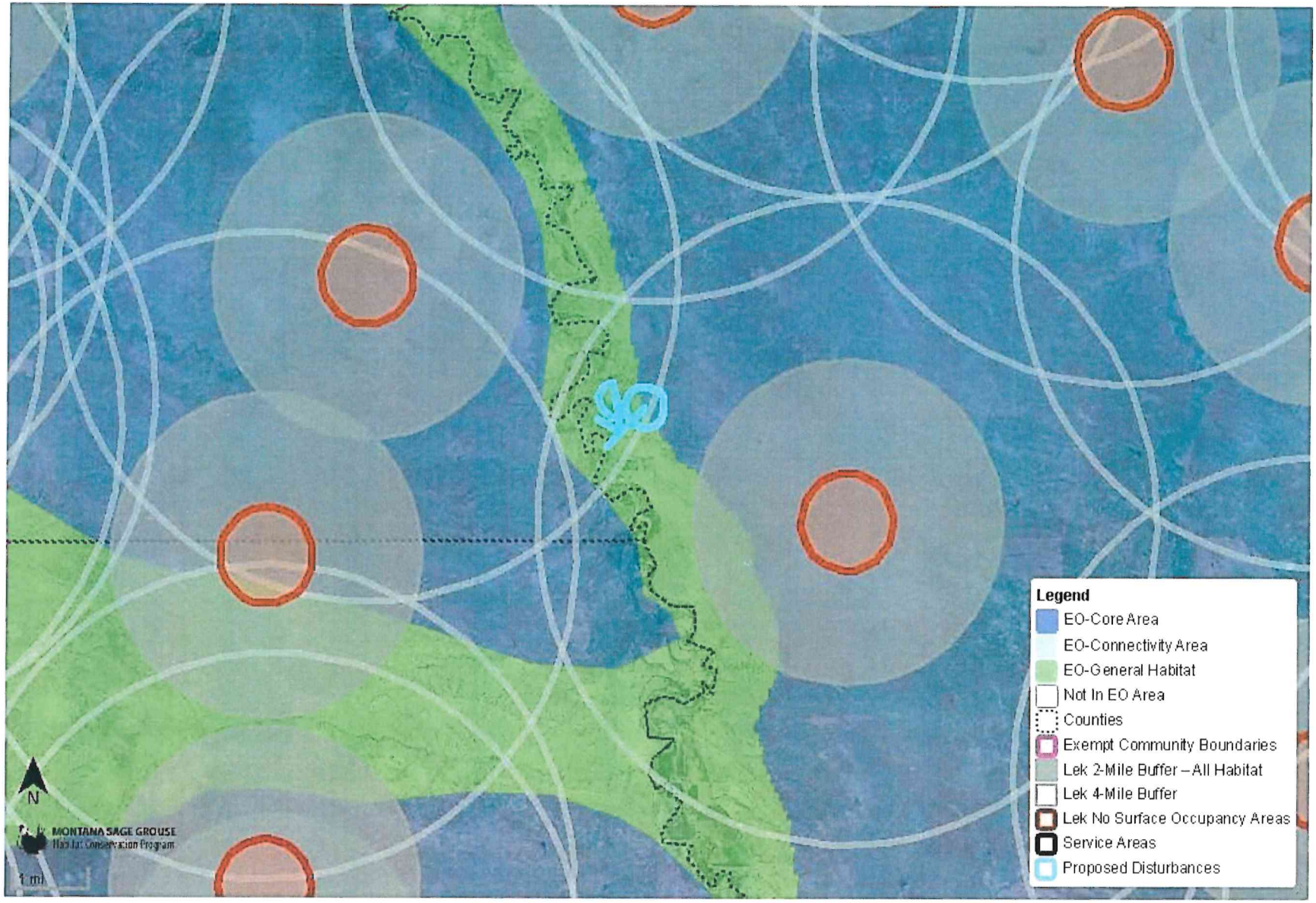


Figure 2

6998 - Boyd Ranch Irrigation Movement and Conversion Project Lek Location Map



Boyd change application for change details

It is my intention to upgrade and change my irrigation rights that were heavily damaged in the 2011 100 year flood and subsequent erosion damage that continues along the banks of the Musselshell River since the flood. DNRC's Technical Analysis identifies that my sprinkler irrigation proposed use will require additional volume because of return flows and consumptive use issues. I have procured the use of 100 shares of Deadmans Basin shares to supplement my uses and do not expect to be able to meet all of my water requirements. I am installing flowmeters on my pumps this spring and expect to only use my historic volume and then using my stored water in Deadmans Basin. I would also like to point out that I will be diverting 5.41 less CFS than I have historically which means every day I pump, I will be diverting 10.73 Acre feet less than historic use. On the lower end of the Musselshell River that could help the fishery, especially in July and August when Irrigation demand is at its peak and stream flows are minimal. The Commissioner can regulate my historic volume easily if granted.

Rights Involved:

40C 167385-00 10/1/1908 1.71 CFS 45 ACRES 4.4 ACRES MOVED

40C 167386-00 10/1/1908 273.77 GPM 16 ACRES

40C 19338-00 12/31/1947 3.12 CFS 35 ACRES

40C 167387-00 7/13/1963 2.05 CFS 54 ACRES

40C 167389-00 5/12/1969 1.82 CFS 37 ACRES

9.31 CFS 187 ACRES

Proposed 186 acres 1,661.45 GPM (3.7 CFS)

PLAN TO MOVE ALL PUMPING FOR 5 WATER RIGHTS TO SWSESE SECTION 29 TWP 12N RGE 31E ROSEBUD CNTY.

PUMPING WILL BE COMPLETED WITH TWO MANIFOLDED PUMPS. 1 IS A 4RB-40-3.4 CORNELL PUMP AND 4HH CORNELL PUMP. COMBINED THEY WILL DIVERT 1,661.45 GPM OR 3.7 CFS TO IRRIGATE 186 ACRES.

PUMPS WILL BE REMOVEABLE BECAUSE OF FLOOD HAZARDS AND STREAM BANK INSTABILITY. ELECTRICAL SERVICE ALREADY EXISTS AND IDENTIFIED POD.

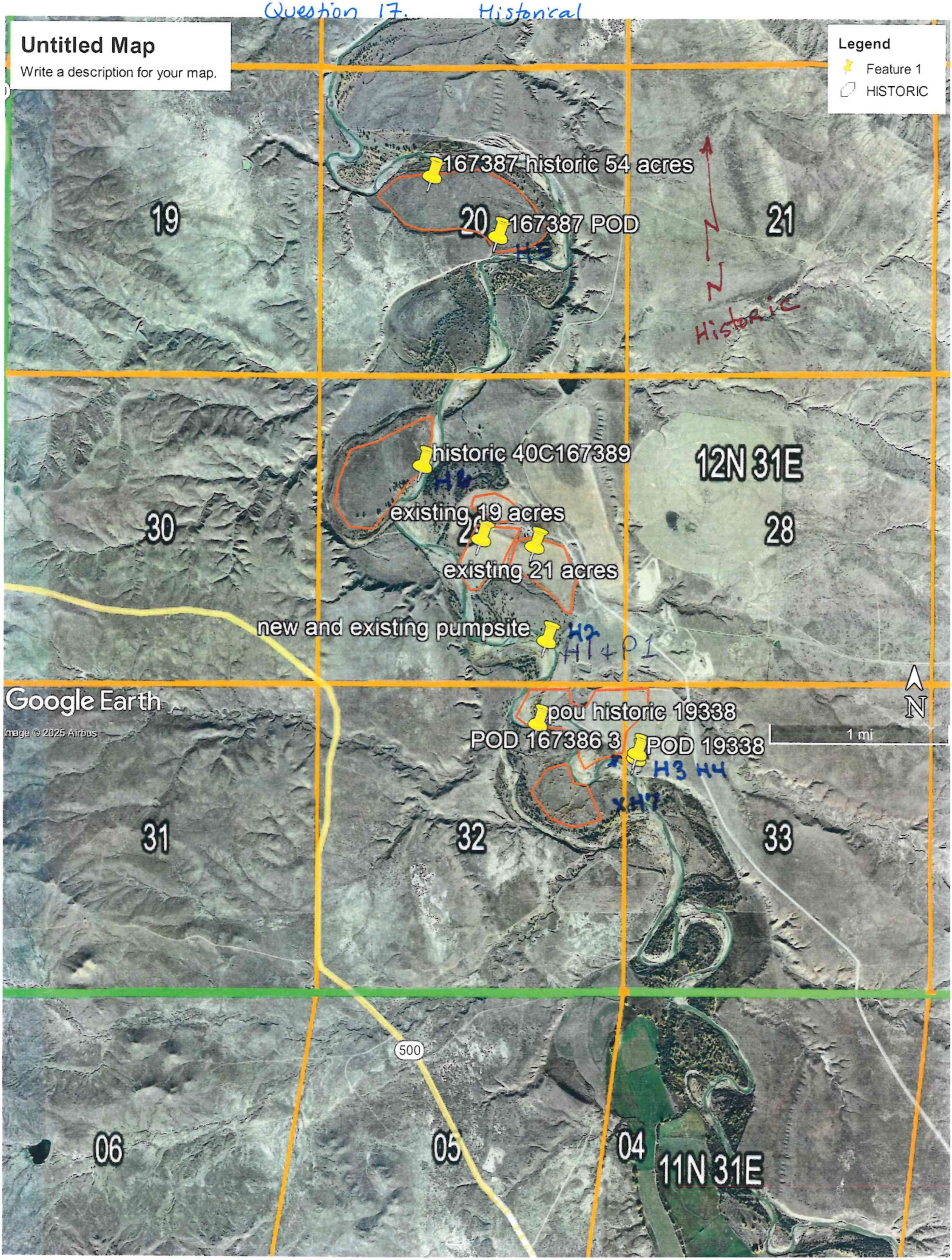
There were 2 associated Masters Reports :

40C 167389 was reduced from 48 acres to 37 acres and flow rate standard was applied and flow rate was reduced from 130 CFS to 1.82 CFS

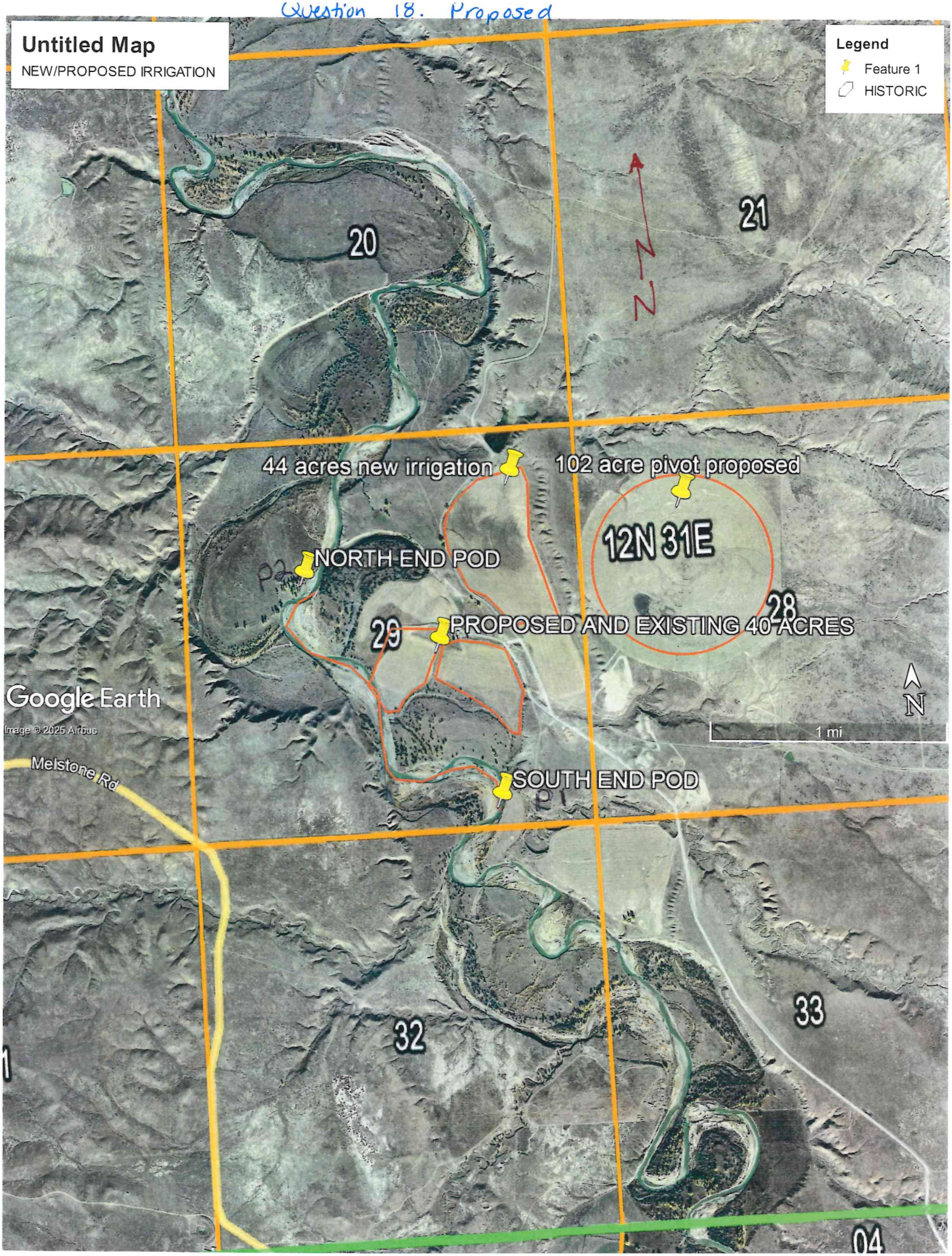
40C 19338 Kept flow rate of 1,400 GPM and reduced acres from 50 acres to 35 acres

Masters Reports attached

Question 17. Historical



Question 18. Proposed

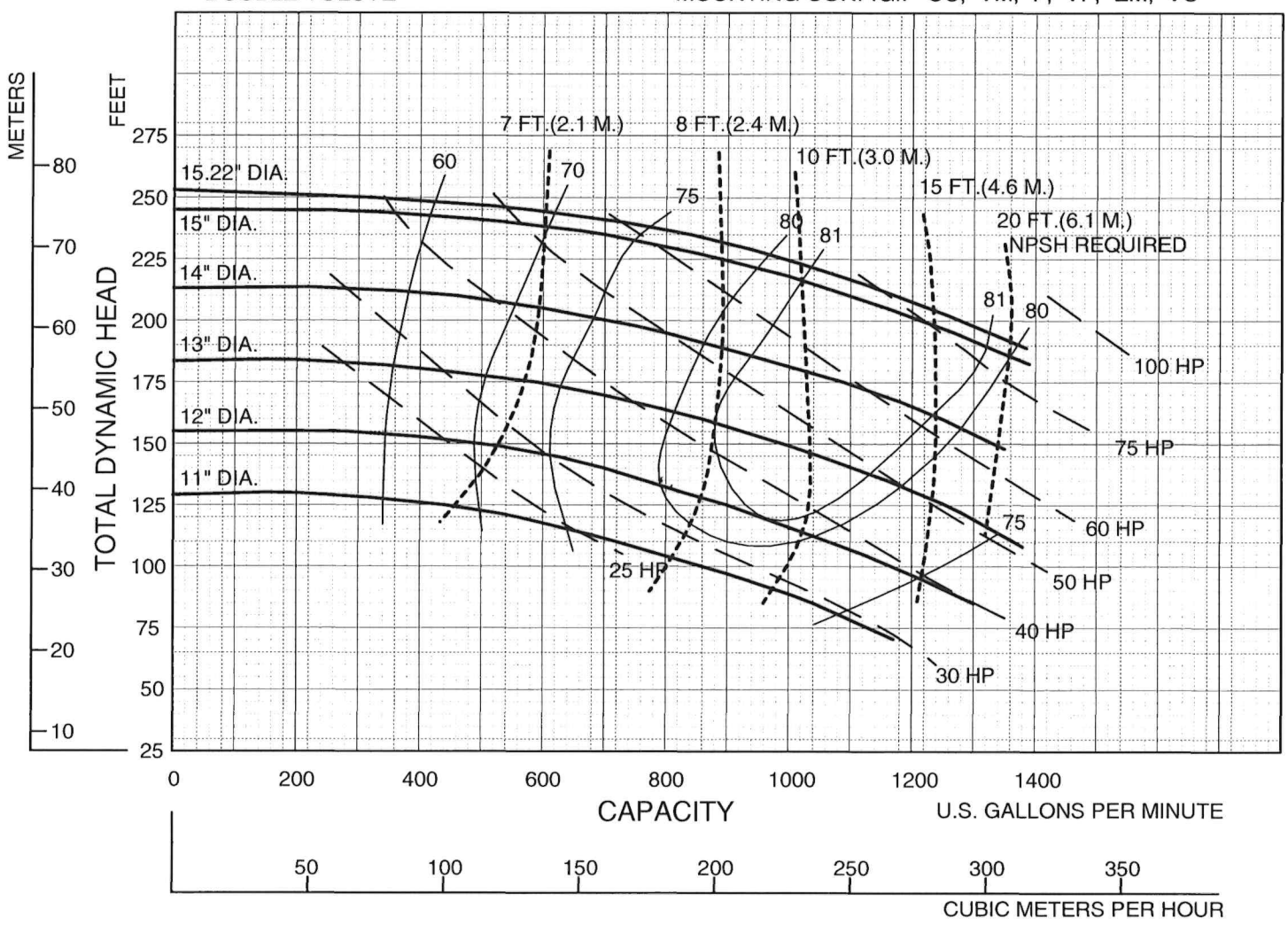


Feet x .305 = Meters
Inches x 25.4 = Millimeters
GPM x .227 = Cubic Meters/Hour
GPM x 3.785 = Liters/Minute
HP x .746 = KW

Speed	Impeller Dia.	Style	Solids Dia.	N_S	Suction	Discharge	No. vanes
1780	VARIOUS	ENCLOSED	.62"	1135	6"	4"	6

DOUBLE VOLUTE

MOUNTING CONFIG.: CC, VM, F, VF, EM, VC



Performances shown are for cool water, close-coupled electric configuration with packing. Other mounting styles or liquids may require horsepower and/or performance adjustments.

6/99

CORNELL
Efficient by Design

Cornell Pump Company • Portland, Oregon

4HH - 1800 RPM

NEW PAGE

4HH18

Question 30a
Question 33

Question 30a
Question 33

SUPERSEDES
136-63,63C

NOVEMBER 1984

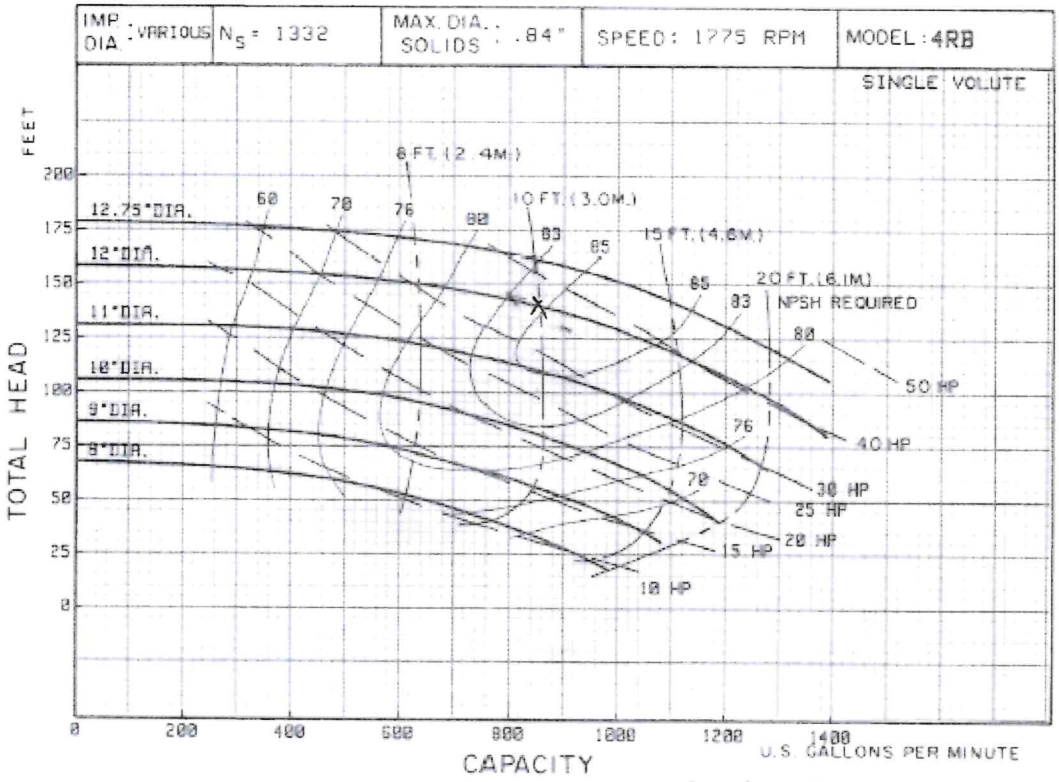
136-25

MODEL 4RB PUMP

SPEED - 1800 RPM

CLOSED IMPELLER

60 HERTZ



FT. x (.305) = METERS

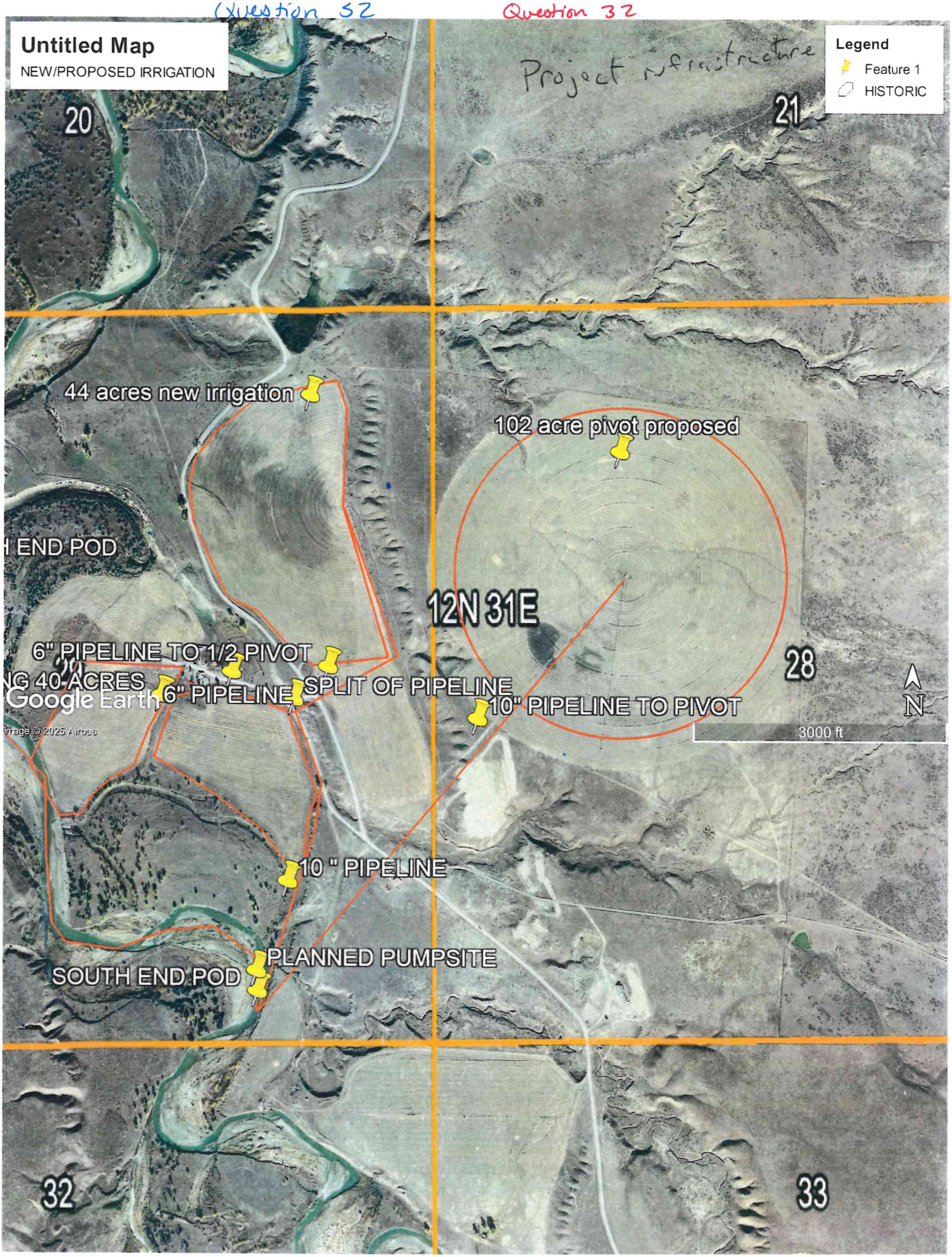
GPM x (.227) = CUBIC METERS PER HOUR

HP	MAXIMUM IMPELLER DIAMETER	
	FOR FULL MOTOR LOAD	FOR FULL MOTOR LOAD + 15% S.F.
50	A(12.75")	
40	B(12.00")	B+(12.62")
30	C(11.00")	C+(11.50")
25	D(10.50")	D+(10.75")
20	E(9.75")	E+(10.25")
15	F(8.94")	F+(9.38")
10	G(8.00")	G+(8.38")

Performances shown are for close-coupled electric configuration with packing.
Other mounting styles may require horsepower and/or performance adjustments.

CORNELL PUMP CO. — PORTLAND, OREGON

Question 32 Question 32



34 CC

Water Flow (GPM) Capacity Based on ID Size and Pressure

PRESSURE FLOW IN GPM THROUGH PIPE ID IN INCHES

PSI	1"	1.25"	1.5"	2"	2.5"	3"	4"
20	26	47	76	161	290	468	997
30	32	58	94	200	360	582	1240
40	38	68	110	234	421	680	1449
50	43	77	124	264	475	767	1635
60	47	85	137	291	524	846	1804
75	53	95	153	329	591	955	2035
100	62	112	180	384	690	1115	2377
125	70	126	203	433	779	1258	2681
150	77	139	224	478	859	1388	2958
200	90	162	262	558	1004	1621	3455

Water Flow Capacity in Steel Pipes (sch 40)

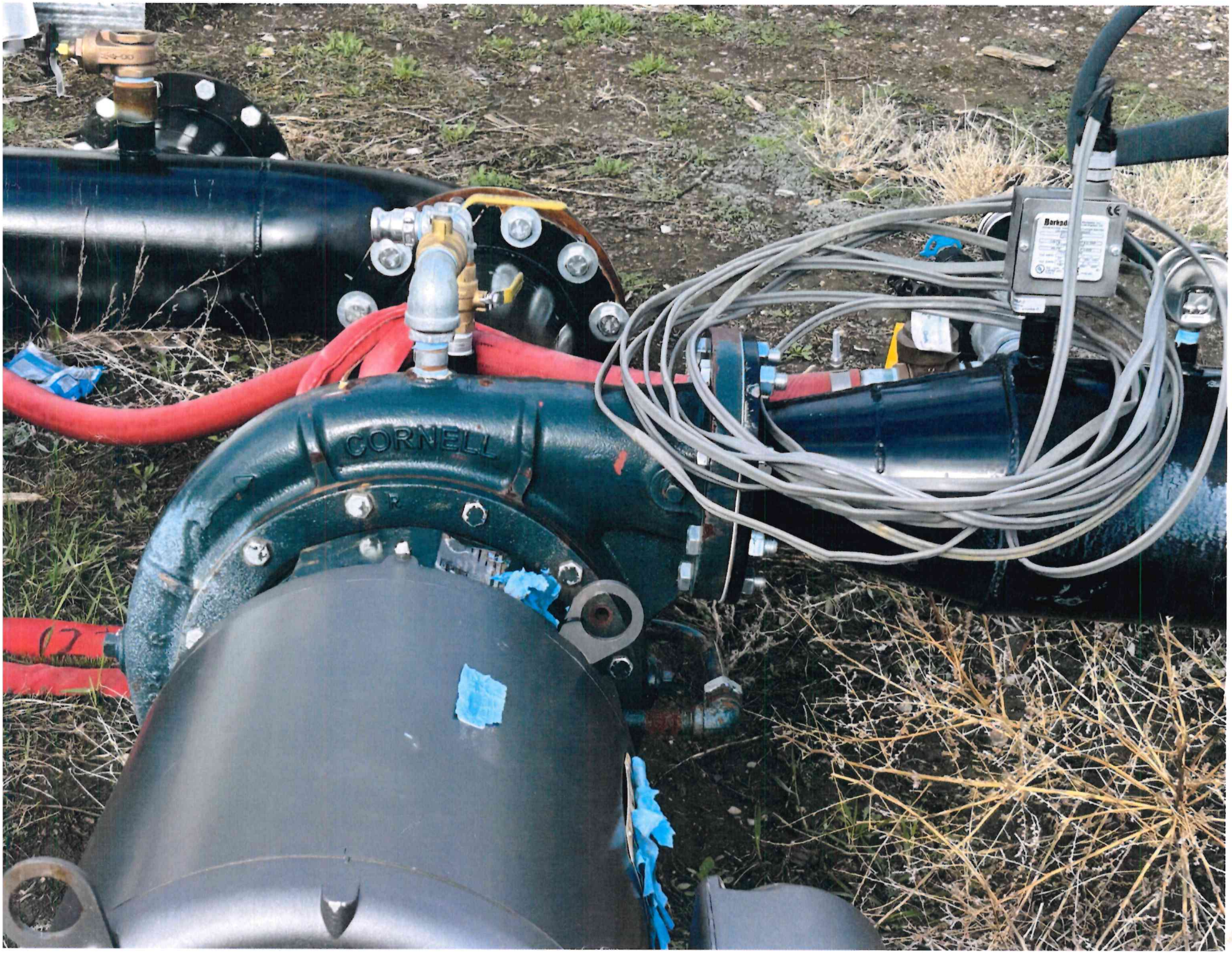
Pipe Size	Maximum Flow (gal/min)	Velocity (ft/s)	Head Loss (ft/100 ft)
2"	45	4.3	3.9
2-1/2"	75	5.0	4.1
3"	130	5.6	3.9
4"	260	6.6	4.0
6"	800	8.9	4.0
8"	1,600	10.3	3.8
10"	3,000	12.2	4.0

34CC

12"	4,700	13.4	4.0
14"	6,000	14.2	4.0
16"	8,000	14.5	3.5
18"	10,000	14.3	3.0
20"	12,000	13.8	2.4
24"	18,000	14.4	2.1

View full post


CORNELL PUMP CO.
PORTLAND OREGON USA
MODEL
4RB-40-3-4
SERIAL
253650 12.00
SM8134A-EP
PEI CL 0.95


CORNELL

CONT
MAX AMB
40
SHAFT END BRG
314
AMP
460
HZ
60
NEMA NOM. EFF
91.7
NOM PF
82
SF
1.15
CODE
B
PH
3
CODE
B
CONT
MAX AMB
40
SHAFT END BRG
314
P/N A150980-55
460
AMP
HZ
60
NEMA NOM. EFF
91.7
NOM PF
82
SF
1.15
CORR AMPS
80


CORNELL PUMP CO.
PORTLAND OREGON USA
MODEL
4RB-40-3-4
SERIAL
253650 12.00
SM8134A-EP
PEI CL 0.95


POLARIS
RANGER

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 40C 167385-00 STATEMENT OF CLAIM

Version: 2 -- REEXAMINED

Version Status: ACTIVE

Owners: NATALIE C BOYD
PO BOX 188
MELSTONE, MT 59054-0188

PAUL J BOYD
PO BOX 188
MELSTONE, MT 59054-0188

Priority Date: OCTOBER 1, 1908

Enforceable Priority Date: OCTOBER 1, 1908

Type of Historical Right: FILED

Purpose (Use): IRRIGATION

Irrigation Type: FLOOD

Maximum Flow Rate: 1.71 CFS

Maximum Volume: THE TOTAL VOLUME OF THIS WATER RIGHT SHALL NOT EXCEED THE AMOUNT PUT TO HISTORICAL AND BENEFICIAL USE.

Climatic Area: 1 - HIGH

Maximum Acres: 45.00

Source Name: MUSSELSHELL RIVER

Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		SWSESE	29	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

Period of Use: MAY 1 to OCTOBER 15

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	6.00		W2NESE	29	12N	31E	ROSEBUD
2	21.00		NWSE	29	12N	31E	ROSEBUD
3	3.00		NWSESE	29	12N	31E	ROSEBUD
4	15.00		E2NESW	29	12N	31E	ROSEBUD
Total:	45.00						

Geocodes/Valid: 29-2153-29-1-01-01-1239 - Y 29-2153-29-4-01-01-0000 - Y

Remarks:

STARTING IN 2008, PERIOD OF DIVERSION WAS ADDED TO MOST CLAIM ABSTRACTS, INCLUDING THIS ONE.

OWNERSHIP UPDATE RECEIVED

OWNERSHIP UPDATE TYPE DOR # 92206 RECEIVED 07/14/2010.

OWNERSHIP UPDATE TYPE DOR # 85544 RECEIVED 09/03/2010.

OWNERSHIP UPDATE TYPE DOR # 103151 RECEIVED 07/12/2012.

OWNERSHIP UPDATE TYPE DOR # 222866 RECEIVED 10/22/2020.

OWNERSHIP UPDATE TYPE 608 # 243102 RECEIVED 10/31/2022.

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 40C 167386-00 STATEMENT OF CLAIM

Version: 2 -- REEXAMINED

Version Status: ACTIVE

Owners: NATALIE C BOYD
PO BOX 188
MELSTONE, MT 59054-0188

PAUL J BOYD
PO BOX 188
MELSTONE, MT 59054-0188

Priority Date: OCTOBER 1, 1908

Enforceable Priority Date: OCTOBER 1, 1908

Type of Historical Right: FILED

Purpose (Use): IRRIGATION

Irrigation Type: FLOOD

Maximum Flow Rate: 273.77 GPM

Maximum Volume: THE TOTAL VOLUME OF THIS WATER RIGHT SHALL NOT EXCEED THE AMOUNT PUT TO HISTORICAL AND BENEFICIAL USE.

Climatic Area: 1 - HIGH

Maximum Acres: 16.00

Source Name: MUSSELSHELL RIVER

Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		SWSESE	29	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

2		NWSWNW	33	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

3		NWSWNW	33	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

Period of Use: MAY 1 to OCTOBER 15

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	2.00		SWNENE	32	12N	31E	ROSEBUD
2	10.00		NWSENE	32	12N	31E	ROSEBUD

3	4.00	SWSENE	32	12N	31E	ROSEBUD	
Total:	16.00						

Geocodes/Valid: 29-2153-32-1-01-01-0000 - Y

Remarks:

STARTING IN 2008, PERIOD OF DIVERSION WAS ADDED TO MOST CLAIM ABSTRACTS, INCLUDING THIS ONE.

OWNERSHIP UPDATE RECEIVED

OWNERSHIP UPDATE TYPE DOR # 92206 RECEIVED 07/14/2010.

OWNERSHIP UPDATE TYPE DOR # 85544 RECEIVED 09/03/2010.

OWNERSHIP UPDATE TYPE DOR # 103151 RECEIVED 07/12/2012.

OWNERSHIP UPDATE TYPE DOR # 211005 RECEIVED 10/26/2020.

OWNERSHIP UPDATE TYPE 608 # 243102 RECEIVED 10/31/2022.

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 40C 167387-00 STATEMENT OF CLAIM

Version: 2 -- REEXAMINED

Version Status: ACTIVE

Owners: NATALIE C BOYD
PO BOX 188
MELSTONE, MT 59054-0188

PAUL J BOYD
PO BOX 188
MELSTONE, MT 59054-0188

Priority Date: JULY 13, 1963

Enforceable Priority Date: JULY 13, 1963

Type of Historical Right: USE

Purpose (Use): IRRIGATION

Irrigation Type: FLOOD

Maximum Flow Rate: 2.05 CFS

Maximum Volume: THE TOTAL VOLUME OF THIS WATER RIGHT SHALL NOT EXCEED THE AMOUNT PUT TO HISTORICAL AND BENEFICIAL USE.

Climatic Area: 1 - HIGH

Maximum Acres: 54.00

Source Name: MUSSELSHELL RIVER

Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		NWNWSE	20	12N	31E	PETROLEUM

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

Period of Use: MAY 1 to OCTOBER 15

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	22.00		SWNE	20	12N	31E	PETROLEUM
2	22.00		SENW	20	12N	31E	PETROLEUM
3	10.00		NWSE	20	12N	31E	PETROLEUM
Total:	54.00						

Geocodes/Valid: 55-2152-20-2-03-01-0000 - Y

Remarks:

STARTING IN 2008, PERIOD OF DIVERSION WAS ADDED TO MOST CLAIM ABSTRACTS, INCLUDING THIS ONE.

OWNERSHIP UPDATE RECEIVED

OWNERSHIP UPDATE TYPE DOR # 92206 RECEIVED 07/14/2010.

OWNERSHIP UPDATE TYPE DOR # 85544 RECEIVED 09/03/2010.

OWNERSHIP UPDATE TYPE DOR # 103151 RECEIVED 07/12/2012.

OWNERSHIP UPDATE TYPE DOR # 211005 RECEIVED 10/26/2020.

OWNERSHIP UPDATE TYPE 608 # 243102 RECEIVED 10/31/2022.

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 40C 167389-00 STATEMENT OF CLAIM

Version: 2 -- REEXAMINED

Version Status: ACTIVE

Owners: NATALIE C BOYD
PO BOX 188
MELSTONE, MT 59054-0188

PAUL J BOYD
PO BOX 188
MELSTONE, MT 59054-0188

Priority Date: MAY 12, 1969

Enforceable Priority Date: MAY 12, 1969

Type of Historical Right: USE

Purpose (Use): IRRIGATION

Irrigation Type: FLOOD

Maximum Flow Rate: 1.82 CFS

Maximum Volume: THE TOTAL VOLUME OF THIS WATER RIGHT SHALL NOT EXCEED THE AMOUNT PUT TO HISTORICAL AND BENEFICIAL USE.

Climatic Area: 1 - HIGH

Maximum Acres: 37.00

Source Name: MUSSELSHELL RIVER

Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		NESENW	29	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO OCTOBER 15

Diversion Means: PUMP

Period of Use: MAY 1 to OCTOBER 15

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	7.00		S2NENW	29	12N	31E	ROSEBUD
2	3.00		SENWNW	29	12N	31E	ROSEBUD
3	8.00		N2SENW	29	12N	31E	ROSEBUD
4	19.00		SWNW	29	12N	31E	ROSEBUD
Total:	37.00						

Geocodes/Valid: 29-2153-29-1-01-01-1239 - Y

Remarks:

STARTING IN 2008, PERIOD OF DIVERSION WAS ADDED TO MOST CLAIM ABSTRACTS, INCLUDING THIS ONE.

OWNERSHIP UPDATE RECEIVED

OWNERSHIP UPDATE TYPE DOR # 92206 RECEIVED 07/14/2010.

OWNERSHIP UPDATE TYPE DOR # 85544 RECEIVED 09/03/2010.

OWNERSHIP UPDATE TYPE DOR # 103151 RECEIVED 07/12/2012.

OWNERSHIP UPDATE TYPE DOR # 222866 RECEIVED 10/22/2020.

OWNERSHIP UPDATE TYPE 608 # 243102 RECEIVED 10/31/2022.

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

1424 9TH AVENUE P.O. BOX 201601 HELENA, MONTANA 59620-1601

GENERAL ABSTRACT

Water Right Number: 40C 19338-00 STATEMENT OF CLAIM

Version: 3 -- POST DECREE

Version Status: ACTIVE

Owners: NATALIE C BOYD
PO BOX 188
MELSTONE, MT 59054-0188

PAUL J BOYD
PO BOX 188
MELSTONE, MT 59054-0188

Priority Date: DECEMBER 31, 1947

Enforceable Priority Date: DECEMBER 31, 1947

Type of Historical Right: USE

Purpose (Use): IRRIGATION

Irrigation Type: SPRINKLER

Maximum Flow Rate: 3.12 CFS

THE FLOW RATE OF THIS RIGHT IS BASED ON PUMP CAPACITY.

Maximum Volume: 115.00 AC-FT

THE WATER COURT HAS DETERMINED THAT A VOLUME QUANTIFICATION IS REQUIRED TO ADEQUATELY ADMINISTER THIS RIGHT.

Climatic Area: 1 - HIGH

Maximum Acres: 35.00

Source Name: MUSSELSHELL RIVER

Source Type: SURFACE WATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		SESENE	32	12N	31E	ROSEBUD

Period of Diversion: MAY 1 TO SEPTEMBER 30

Diversion Means: PUMP

Period of Use: MAY 1 to SEPTEMBER 30

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1	30.00		NE	32	12N	31E	ROSEBUD
2	5.00		W2NWNW	33	12N	31E	ROSEBUD
Total:	35.00						

Geocodes/Valid: 29-2153-32-1-01-01-0000 - Y 29-2153-33-1-01-01-1535 - Y

Remarks:

THE WATER RIGHTS LISTED FOLLOWING THIS STATEMENT ARE MULTIPLE USES OF THE SAME RIGHT. THE USE OF THIS RIGHT FOR SEVERAL PURPOSES DOES NOT INCREASE THE EXTENT OF THE WATER RIGHT. RATHER IT DECREES THE RIGHT TO ALTERNATE AND EXCHANGE THE USE (PURPOSE) OF THE WATER IN ACCORD WITH HISTORICAL PRACTICES.

19336-00 19338-00

OWNERSHIP UPDATE RECEIVED

OWNERSHIP UPDATE TYPE DOR # 114334 RECEIVED 03/21/2013.

OWNERSHIP UPDATE TYPE DOR # 222866 RECEIVED 10/22/2020.

OWNERSHIP UPDATE TYPE 608 # 243102 RECEIVED 10/31/2022.

September 26, 2025

Paul and Natalie Boyd
PO Box 188
Melstone, MT 59054

Subject: Completed Technical Analysis for Change Prepplication No. 40C 30170690

Dear Applicant,

As designated on the submitted Preapplication Meeting Form per §85-2-302(3)(b), MCA, the Department of Natural Resources and Conservation (DNRC or Department) has completed the technical analyses for Change Prepplication No. 40C 30170690 based on the information provided in your Preapplication Meeting Form accepted by the Department on July 1, 2025. The technical analyses can be found in the attached report. Please note, this Change Technical Analyses Report is a two-part publication, comprised of a Part A completed by Chris Schweigert, Billings Regional Office and a Part B completed by Jack Landers, Water Sciences Bureau.

This Technical Analyses Report **IS**: A collection of facts that the DNRC has gathered, including content provided in the Preapplication Meeting Form materials. The Department will use these data to analyze the criteria in §85-2-402, MCA if you submit an application for the project described in the completed Preapplication Meeting Form.

This Technical Analyses Report **IS NOT**: An analysis or discussion of whether the Preapplication Meeting Form as filed meets the criteria (§85-2-402, MCA).

You have 180 days to submit the Water Right Change Application Form 606 considering the information provided in the technical analyses and Preapplication Meeting Form. If the Application Form is not submitted to the Billings Regional Office by **March 26, 2026**, a new preapplication meeting will be required to process the Application with expedited timelines (ARM 36.12.1302(6)(b)). If any details described in the submitted Application are changed from that of the submitted Preapplication Meeting Form, the discounted filing fee and expedited timelines will not

apply (ARM 36.12.1302(6)(a)). Please note that the technical analyses will expire one year from the date of this letter (ARM 36.12.1302(8)).

Please let me know if you have any questions.

Sincerely,

Christine Schweigert
Hydrologist
Billings Regional Office
cschweigert@mt.gov
406-247-4419
1371 Rimtop Drive, Billings, MT 59105

CC: Pat Riley

Surface Water Change Technical Analyses Report – Part A

Department of Natural Resources and Conservation (DNRC or Department)
Water Resources Division
Chris Schweigert, Hydrologist, Billings Regional Office

Application No.	40C 30170690	**Proposed Point of Diversion**	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County
Applicant	Paul and Natalie Boyd		

Overview

This report is Part A of a two-part publication which analyzes data submitted by the Applicant in support of the above-mentioned water right application. This report provides technical analyses as required under the Administrative Rules of Montana (ARM) 36.12.1303 in support of the water rights criteria assessment as required in § 85-2-402 Montana Code Annotated (MCA).

This Surface Water Change Technical Analyses Report – Part A contains the following sections:

1.0 Application Details

The Applicant proposes to change the points of diversion (POD) and places of use (POU) for Statements of Claim numbers 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389, and 40C 19338-00. The proposed POU is located in the NE and S2 Sec. 29, and the NW and N2N2SW Sec. 28, T12N, R31E. The project is in Rosebud and Petroleum Counties, and the source is the Musselshell River.

Table 1. Water Rights Proposed for Change

Water Right Number	Flow Rate (CFS)	Volume	Purpose/ Acres	Period Of Use	Place Of Use	Point(s) Of Diversion	Priority Date
40C 167385-00	1.71	Amount put to historical and beneficial use	Irrigation 45 AC	5/1 to 10/15	W2NESE, NWSE, NWSESE, and E2NESW Sec. 29, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E, Rosebud County	10/1/1908
40C 167386-00	0.61	Amount put to historical and beneficial use	Irrigation 16 AC	5/1 to 10/15	SWNENE, NWSENE, and SWSENE Sec. 32, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E; NWSWNW Sec. 33, T12N, R31E; NWSWNW Sec. 33, T12N, R31E, Rosebud County	10/1/1908
40C 167387-00	2.05	Amount put to historical and beneficial use	Irrigation 54 AC	5/1 to 10/15	SWNE, SENW, and NWSE Sec. 20, T12N, R31E, Petroleum County	NWNWSE Sec. 20, T12N, R31E, Petroleum County	7/13/1963
40C 167389-00	1.82	Amount put to historical and beneficial use	Irrigation 37 AC	5/1 to 10/15	S2NENW, SENWNW, N2SENW, and SWNW Sec. 29, T12N, R31E, Rosebud County	NESENW Sec. 29, T12N, R31E, Rosebud County	5/12/1969
40C 19338-00	3.12	115 AF	Irrigation 35 AC	5/1 to 9/30	NE Sec. 32, T12N, R31E, and W2NWNW Sec. 33, T12N, R31E, Rosebud County	SESENE Sec. 32, T12N, R31E, Rosebud County	12/31/1947

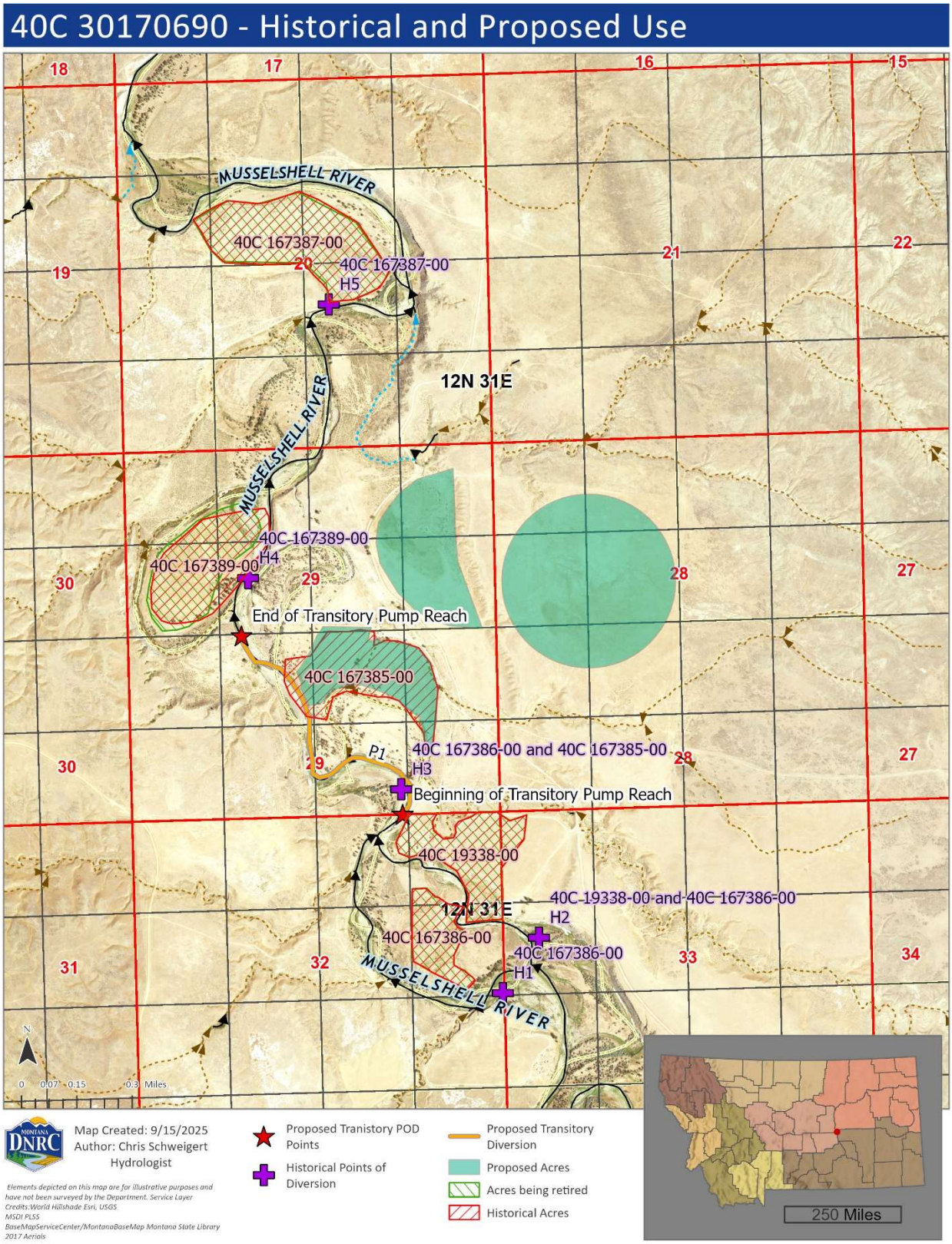


Figure 1. Map of the Applicant's historical and proposed POD on the source and the historical and proposed place of use.

2.0 Historical Use Technical Analysis

2.1 Historical Field Consumed and Applied Volumes

The consumed volume for irrigation is based on the net irrigation requirement (NIR) from USDA Natural Resources Conservation Service Irrigation Water Requirements (IWR) at a representative weather station. The NIR is multiplied by a county-wide management factor (from ARM 36.12.1902) to produce an adjusted NIR representative of actual crop yields in Montana. Crop consumption is determined by multiplying the adjusted NIR by the number of acres of irrigation. Crop consumption is then divided by the field efficiency identified from the irrigation method and ARM 36.12.115. Irrecoverable losses (IL) are 5% of the field applied volume for flood irrigation or 10% for sprinkler irrigation. The total consumed volume for irrigation is the crop consumption plus irrecoverable losses. The total non-consumed volume is the field applied volume minus the total consumed volume.

Statement of Claim 40C 167385-00

USDA aerial photo no. 278-21 dated 9/14/1979, and 478-87 dated 7/21/1980 show 45 acres irrigated within the claimed place of use for Statement of Claim 40C 167385-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 45 acres irrigated within the claimed place of use for Statement of Claim 40C 167385-00.

The Applicant hasn't provided any information to substantiate the flow rate. The flow rate for this claim was reduced from 5 CFS to 1.71 CFS by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination irrigation standard of 17 GPM/AC for 16 acres. The flow rate of 1.71 CFS was maintained on the Reexamined version of Statement of Claim 40C 167385-00.

Statement of Claim 40C 167385-00 has been historically used to flood irrigate 45 acres with a priority date of October 1, 1908, from the Musselshell River using a pump in the SWSESE Sec. 29, T12N, R31E, Rosebud County at 1.71 CFS from May 1 to October 15. The place of use includes 6 acres in the W2NESE, 21 acres in the NWSE, 3 acres in the NWSESE, and 15 acres in the E2NESW Sec. 29, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field application volumes have been calculated with the inputs shown in Table 2 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 2. Historical use for Statement of Claim 40C 167385-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	45	23.18	0.477	0.6	41.46	3.46	44.92	69.11

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167386-00

USDA aerial photos no. 278-21 and 278-29 dated 9/14/1979, show 16 acres irrigated within the claimed place of use for Statement of Claim 40C 167386-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 16 acres irrigated within the claimed place of use for Statement of Claim 40C 167386-00.

The Applicant hasn't provided any information to substantiate the flow rate. The flow rate for this claim was reduced from 5 CFS to 273.77 GPM (0.61 CFS) by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination irrigation standard of 17 GPM/AC for 16 acres. The flow rate of 273.77 was maintained on the Reexamined version of Statement of Claim no. 40C 167386-00.

Statement of Claim 40C 167386-00 has been used historically to flood irrigate 16 acres with a priority date of October 1, 1908, from the Musselshell River using a pump in the SWSESE Sec. 29, a pump in the NWSWNW Sec. 33, and a pump in the NWSWNW Sec. 33, T12N, R31E, Rosebud County at 273.77 GPM from May 1 to October 15. The place of use includes 2 acres in the SWNENE, 10 acres in the NWSENE, and 4 acres in the SWSENE Sec. 32, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field application volumes have been calculated with the inputs shown in Table 3 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 3. Historical use for Statement of Claim 40C 167386-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	16	23.18	0.477	0.6	14.74	1.23	15.97	24.57

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167387-00

USDA aerial photo no. 478-87 dated 7/21/1980, shows 54 acres irrigated within the claimed place of use for Statement of Claim 40C 167387-00.

Water Resources Survey photo MA-29 160 dated circa 1944 shows 54 acres irrigated within the claimed place of use for Statement of Claim 40C 167387-00.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 10-inch Crisafulli regular lift pump driven by a 540 power-take-off (PTO) of a 4020 John Deere tractor. The pump curve for a 10-inch Crisafulli pump indicates that the pump has a capacity of 7.79 CFS, 4.04 CFS greater than the claimed 3.75 CFS. The flow rate for this claim was reduced

to 2.05 CFS by the DNRC in 1984 after applying the Montana Supreme Court Rules for Claims Examination, irrigation standard of 17 GPM/AC for 54 acres.

Statement of Claim 40C 167387-00 has been used historically to flood irrigate 54 acres with a priority date of July 13, 1963, from the Musselshell River using a pump in the NWNWSE Sec. 20, T12N, R31E, Petroleum County at 2.05 CFS from May 1 to October 15. The place of use includes 22 acres in the SWNE, 22 acres in the SENW, and 10 acres in the NWSE Sec. 20, T12N, R31E, Petroleum County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field applied volumes have been calculated with the inputs shown in Table 4 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 4. Historical Use for Statement of Claim 40C 167387-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	54	23.18	0.477	0.6	49.76	4.15	53.90	82.93

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 167389-00

USDA aerial photo nos. 278-21 dated 9/14/1979, and 478-87 dated 7/21/1980, show 37 acres irrigated within the claimed place of use for Statement of Claim 40C 167389-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 37 acres irrigated within the claimed place of use for Statement of Claim 40C 167389-00.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 10-inch Crisafulli regular lift pump driven by a 540 power-take-off (PTO) of a 4020 John Deere tractor. The same pump was used for Statement of Claim 40C 167387-00. The pump curve for a 10-inch Crisafulli pump indicates that the pump has a capacity of 7.79 CFS.

A Master's Report filed November 17, 1982, and adopted December 21, 1992, explains that the claimed flow rate of 130 CFS and volume of 240 AF for irrigation of 48 acres were changed by DNRC during claims examination according to the Montana Supreme Court Rules for Claims Examination. The Department changed the flow rate to 1.82 CFS based on the standard of 17 GPM per acre for 48 acres. The volume was removed and replaced with a standard remark limiting the volume to the amount put to historical and beneficial use. The acreage was reduced to 37 acres based on verified acres found during the claim examination. The flow rate was not reduced with the acreage and is equal to 22.1 GPM per acre.

A memorandum in the file dated January 20, 2004, from Jim Gilman, DNRC, to Bruce Loble, Chief Water Judge, explains that standards were run for basin 40C and that several Statements of Claim, including 40C 167389-00, did not conform to standards and that the flow rate for 40C

167389-00 should be reduced to 1.4 CFS which would equate to 17 GPM per acre for 37 acres. At this time, that change has not been made to Statement of Claim 40C 167389-00 and the flow rate remains 1.82 CFS.

Statement of Claim 40C 167389-00 has been use historically to flood irrigate 37 acres with a priority date of May 12, 1969, from the Musselshell River using a pump in the NESENW Sec. 29, T12N, R31E, Rosebud County at 1.82 CFS from May 1 to October 15. The place of use includes 7 acres in the S2NENW, 3 acres in the SENWNW, 8 acres in the N2SENW, and 19 acres in the SWNW Sec. 29, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage.

The historical consumed and field applied volumes have been calculated with the inputs shown in Table 5 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 5. Historical Use for Statement of Claim 40C 167389-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Flood	37	23.18	0.477	0.6	34.09	2.84	36.93	56.82

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Statement of Claim 40C 19338-00

USDA aerial photo no. 278-21 dated 9/14/1979, shows 35 acres irrigated within the claimed place of use for Statement of Claim 40C 19338-00.

Water Resources Survey photo MA-29 159 dated circa 1944 shows 35 acres irrigated within the claimed place of use for Statement of Claim 40C 19338-00.

A Master's Report filed April 21, 1992, adopted May 12, 1992, explains that Statement of Claim 40C 19338-00 was filed for a flow rate of 1,400 GPM by means of a pump from the Musselshell River and a volume of 115 AF per year for the irrigation of 50 acres in Sec. 32 and 33, T12N, R31E. It further explains that the claimed acres were changed by DNRC during claims examination according to the Montana Supreme Court Rules for Claims Examination. The acreage was reduced from 50 acres to 35 acres based on verified acres found on USDA aerial photo no. 378-242 dated 1979, during the claim examination. The flow rate, 1,400 GPM, was not reduced with the acreage, is based on the pump capacity, and is equal to 40 GPM per acre. After the Master's Report was adopted, a volume remark was added to Statement of Claim 40C 19338-00 which says, "The Water Court has determined that a volume quantification is required to adequately administer this right." The Applicant has chosen to use the Department method for calculating the historical diverted and consumed volumes as shown in Table 6 below.

A Master's Report filed February 18, 2020, adopted April 17, 2020, explains the claims included in Case 40C-R258, including 40C 19338-00, filed November 27, 2019, received a late objection during the adjudication of the Basin 40C Temporary Preliminary Decree from Marion and Leo Collier. Because the late objection was not previously resolved, an issue remark was placed on

the claim. The objection was based on ownership, but the objectors passed away before the Water Court addressed the issue. The objection was dismissed, and the issue remark was removed from the claim.

The Applicant's affidavit, based on personal knowledge and information from the original claimant, explains that the historical flow rate is based on the historical pump which was a 1,400 GPM pump to level border dikes. The Applicant's affidavit states the historical pump was a 6-inch Crisafulli regular lift pump driven by a 540 PTO on a 706 International tractor. Based on 20 feet of lift, the 6-inch Crisafulli would generate the 1,400 GPM flow rate claimed.

Statement of Claim 40C 19338-00 has been used historically to irrigate 35 acres under a wheeline sprinkler with a priority date of December 31, 1947, from the Musselshell River using a pump in the SESENE Sec. 32, T12N, R31E, Rosebud County at 3.12 CFS from May 1 to September 30. The place of use includes 30 acres in the NE Sec. 32, and 5 acres in the W2NWNW Sec. 33, T12N, R31E, Rosebud County. There are no supplemental rights on this place of use and no places of storage. Statement of Claim 40C 19338-00 is a multiple use right with Statement of Claim 40C 19336-00. These claims are multiple uses of the same right. The use of this water for several purposes does not increase the extent of the water right. Rather it decrees the right to alternate and exchange the use (purpose) of the water in accordance with historical practices. Statement of Claim 40C 19336-00 is for 100 GPM for domestic use year-round for 4 households and up to 1.5 acres.

The Applicant has chosen to use the Department method to calculate the historical field applied and consumed volumes. The historical consumed and field applied volumes have been calculated with the inputs shown in Table 6 following the methods described above and in ARM 36.12.1902. The field application volume is calculated by dividing the crop consumption volume by the field efficiency.

Table 6. Historical Use for Statement of Claim 40C 19338-00

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)
Sprinkler	35	23.18	0.477	0.7	32.25	4.61	36.86	46.07

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

Summary of Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 Proposed for Change

The following table is a summary of the historical use for all of the water rights proposed for change.

Table 7. Summary of Historical Use for all Statements of Claim Proposed for Change

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	IL (AF)	Total Consumed Volume (AF)	Field Application Volume (AF)

Sprinkler	35	23.18	0.477	0.7	32.25	4.61	36.86	46.07
Flood	152	23.18	0.477	0.6	140.05	11.68	151.72	233.43
Total	**187**				**172.3**	**16.28**	**188.58**	**279.49**

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor 1964-1973 (Pre-July 1, 1973)

2.2 Historical Conveyance Losses

There are no historical conveyance losses considered for the historical use of Statement of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 because water was diverted directly to the places of use by pumps.

2.3 Historical Diverted Volume

Per ARM 36.12.1902(10), the historically diverted volume is equal to the sum of the historical field application volume and historical conveyance loss volume. Because there are no conveyance losses attributabed to any of the water rights proposed for change, the historical diverted volume is equal to the historical field applied volume.

Table 8. Historically Diverted Volume of Water Rights Proposed for Change

Water Right No.	Field Application Volume (AF)	Conveyance Loss Volume (AF)	Historical Diverted Volume (AF)
40C 167385-00	69.11	0	69.11
40C 167386-00	24.57	0	24.57
40C 167387-00	82.93	0	82.93
40C 167389-00	56.82	0	56.82
40C 19338-00	46.07	0	46.07
Total	**279.5**	**0**	**279.5**

2.4 Summary of Historical Use

The Department will consider the following values when evaluating the historical use of Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00 for the adverse effect criterion:

Table 9. Summary of historical use for Statements of Claim 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00

Water Right No.	Historical Purpose	Maximum Historical Acres	Historical Place of Use	Historical Point of Diversion	Maximum Historical Flow Rate	Historically Consumed Volume (AF)	Historically Diverted Volume (AF)
40C 167385-00	Irrigation	45	W2NESE, NWSE, NWSESE, and E2NESW Sec. 29, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E, Rosebud County	1.71 CFS	41.46	69.11

40C 167386-00	Irrigation	16	SWNENE, NWSENE, and SWSENE Sec. 32, T12N, R31E, Rosebud County	SWSESE Sec. 29, T12N, R31E; NWSWNW Sec. 33, T12N, R31E; NWSWNW Sec. 33, T12N, R31E, Rosebud County	0.61 CFS (273.77 GPM)	14.74	24.57
40C 167387-00	Irrigation	54	SWNE, SENW, and NWSE Sec. 20, T12N, R31E, Petroleum County	NWNWSE Sec. 20, T12N, R31E, Petroleum County	2.05 CFS	49.76	82.93
40C 167389-00	Irrigation	37	S2NENW, SENWNW, N2SENW, and SWNW Sec. 29, T12N, R31E, Rosebud County	NESENW Sec. 29, T12N, R31E, Rosebud County	1.82 CFS	34.09	56.82
40C 19338-00	Irrigation	35	NE Sec. 32, T12N, R31E, and W2NWNW Sec. 33, T12N, R31E, Rosebud County	SESENE Sec. 32, T12N, R31E, Rosebud County	3.12 CFS	32.25	46.07

3.0 Analysis of Impacted Surface Water Sources

3.1 Summary of Proposed Use

The Applicant proposes using Statement of Claim nos. 40C 167385-00, 40C 167386-00, 40C167387-00, 40C 167389-00, and 40C 19338-00 as shown in Table 10:

Table 10. Summary of the proposed use of 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00

Water Right No.	Proposed Purpose	Proposed Acres	Proposed Place of Use	Proposed Point of Diversion	Proposed Flow Rate	Proposed Consumptive Volume (AF)	Proposed Diverted Volume (AF)
40C 167385-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	1.71 CFS	41.46	69.11
40C 167386-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.61 CFS (273.77 GPM)	14.74	24.57

40C 167387-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	1.38 CFS	49.76	82.93
40C 167389-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.00 CFS	34.09	56.82
40C 19338-00	Irrigation	186.4 AC	84.4 AC in Sec. 29, 102 AC in W2 Sec. 28, T12N, R31E, Rosebud County	Transitory pump from W2SESE Sec. 29. T12N, R31E to NWNESW Sec. 29, T12N, R31E, Rosebud County	0.00 CFS	32.25	46.07

Following the procedures outlined in the Historical Use section 2.1 above, the proposed consumed and diverted but non-consumed volumes have been calculated with the inputs shown in Table 11 following the methods described above and in ARM 36.12.1902. Per MCA 85-2-102(7)(b), a change in appropriation right does not include a change in method of irrigation (method of irrigation is also not an element that can be proposed for change). Thus, when calculating the proposed consumed and diverted volumes for a change, the Department will consider a change in the method of irrigation only on newly irrigated acreage, outside of the historically irrigated footprint.

Table 11. Proposed new irrigation inside and outside of the historical place of use.

Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor	Field Efficiency	Crop Consumption (AF)	Field Application Volume (AF)	IL (AF)	Total Consumptive Volume (AF)	Non-Consumptive Volume (AF)
Flood (Inside Historical POU)	40.4	23.18[1]	0.477[3]	0.6	37.22	62.04	3.1	40.33	21.71
Pivot (Outside Historical POU)	146	25.83[2]	0.727[4]	0.9	228.47	253.86	25.39	253.86	0[5]
Total	186.4	-	-	-	265.7	315.90	-	294.18	21.71

[1]Ingomar IWR Weather Station – Flood Irrigation, Wheeline & Handline Seasonal ET inches
[2]Ingomar IWR Weather Station – Center Pivot Irrigation Seasonal ET inches
[3]Rosebud County Historical Use Management Factor 1964-1976 (Pre-July 1, 1973)
[4]Rosebud County Proposed Use Management Factor 1997-2006 (Proposed Use)
[5]Proposed use is 100% consumptive due to 90% efficient sprinkler irrigation and 10% irrecoverable losses

Table 12. Comparison of volumes associated with historical and proposed use.

Purpose	Historically Consumed Volume	Proposed Consumptive Volume	Historically Diverted Volume	Proposed Diverted Volume
Irrigation	188.58	294.18	279.49	315.90

3.2 Impacted Surface Water Sources

The Department has considered an area of potential adverse effect on the Musselshell River. This reach was determined by accounting for the location of the proposed and historical points of diversion and the proposed reduction in return flow as described in Part B. This reach extends from the SESENE Sec. 32, T12N, R31E, downstream to the S2NWSW Sec. 8, T12N, R31E, Rosebud County.

There are 15 water rights within the area of potential adverse effect, as illustrated in Appendix A.

Review

This document has been reviewed by the Department on September 25, 2025.

References

Department Standard Practice for Determining Historical Use
Department Standard Practice to Analyze Return Flows
Water Right Claim Examination Rules Amended by the Montana Supreme Court – Effective December 5, 2006.

Appendix A: Water Rights within the Area of Potential Adverse Effect

Water Right No.	Owner Name	Purpose	Period of	Flow Rate	Volume
40C 30008850	MONTANA, STATE OF DEPT OF FISH WILDLIFE & PARKS	FISHERY	01/01 to 12/31	70 CFS	50674.23
40C 20166200	JUSTIN KINCHELOE; YOHNA PFLUGHOFT	STOCK	01/01 to 12/31		0.00
40C 7069100	KIMBERLY A MAXWELL; THOMAS A MAXWELL; MAXWELL, KIMBERLY A LIVING TRUST	STOCK	10/01 to 04/30	40 GPM	3.50
40C 16738600	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	273.77 GPM	0.00
40C 16738500	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	1.71 CFS	0.00
40C 16738700	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	2.05 CFS	0.00
40C 1933600	BAILEY RITCHEY; JESSE RITCHEY	DOMESTIC	01/01 to 12/31	100 GPM	7.00
40C 1933700	NATALIE C BOYD; PAUL J BOYD; BAILEY RITCHEY; JESSE RITCHEY	IRRIGATION	05/01 to 09/30	3.12 CFS	0.00
40C 1933800	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 09/30	3.12 CFS	115.00
40C 16738900	NATALIE C BOYD; PAUL J BOYD	IRRIGATION	05/01 to 10/15	1.82 CFS	0.00
40C 30141917	USA (DEPT OF INTERIOR BUREAU OF LAND MGMT)	STOCK	01/01 to 12/31		0.00
40C 30141928	USA (DEPT OF INTERIOR BUREAU OF LAND MGMT)	STOCK	01/01 to 12/31		0.00
40C 20029600	ALLAN MCDANIEL	IRRIGATION	04/01 to 10/04	350.06 GPM	0.00
40C 20166300	YOHNA PFLUGHOFT	IRRIGATION	05/01 to 10/01	1.13 CFS	0.00
40C 30008437	ALLAN MCDANIEL; YOHNA PFLUGHOFT	STOCK	01/01 to 12/31		5.1

Surface Water Change Technical Analyses Report - Part B

The Montana Department of Natural Resources and Conservation (DNRC) Water Resources Division

Jack Landers, Groundwater Hydrologist, Water Sciences Bureau (WSB)

Applicant Name	Paul and Natalie Boyd
Application No.	40C 30170690
Point of Diversion Legal Land Description	Township 12 North, Range 31 East, Rosebud and Petroleum Counties

Overview

This report is Part B of a two-part publication which analyzes data submitted by the Applicant in support of the above-mentioned water right change application. This report provides technical analyses as required under the Administrative Rules of Montana (ARM) 36.12.1303 in support of the water rights criteria assessment as required in §85-2-402, Montana Code Annotated (MCA). For applications in closed basins, this report fulfills the requirements of MCA §85-2-361.

This Surface Water Change Technical Analyses Report – Part B contains the following sections:

1.0 Executive Summary

Application Details

The Applicant proposes to change the point of diversion (POD) and place of use (POU) for Statement of Claim Nos. 40C 167385-00, 40C 167386-00, 40C 167387-00, 40C 167389-00, and 40C 19338-00. The water rights proposed for change were historically used to irrigate 187.0 acres with water diverted from the Musselshell River at several PODs listed in **Table 1**. The water rights were not used supplementally, and each water right delivered the full irrigation demand to one of five fields shown in **Figure 1**. The Applicant proposes to retire 146.6 acres, add 146.0 acres of irrigation outside the historical POU, and continue to irrigate 40.4 acres within the historical POU for a total of 186.4 acres. The proposed acres outside the historical POU would be irrigated with a center-pivot sprinkler system with water diverted from the Musselshell River using two transitory pumps. All five water rights proposed for change would be used supplementally on the proposed POU.

Table 1: Water rights proposed for change.

Water Right No	Flow Rate (cfs)	Period of Diversion	Point of Diversion
40C 167385-00	1.71	5/1-10/15	SWSESE Section 29, T12N R31E, Rosebud County
40C 167386-00	0.61	5/1-10/15	SWSESE Section 29, T12N R31E, Rosebud County
40C 167387-00	2.05	5/1-10/15	NWNWSE Section 20, T12N R31E, Rosebud County
40C 167389-00	1.82	5/1-10/15	NESENW Section 29, T12N R31E, Rosebud County
40C 19338-00	3.12	5/1-9/30	SESENE Section 32, T12N R31E, Rosebud County

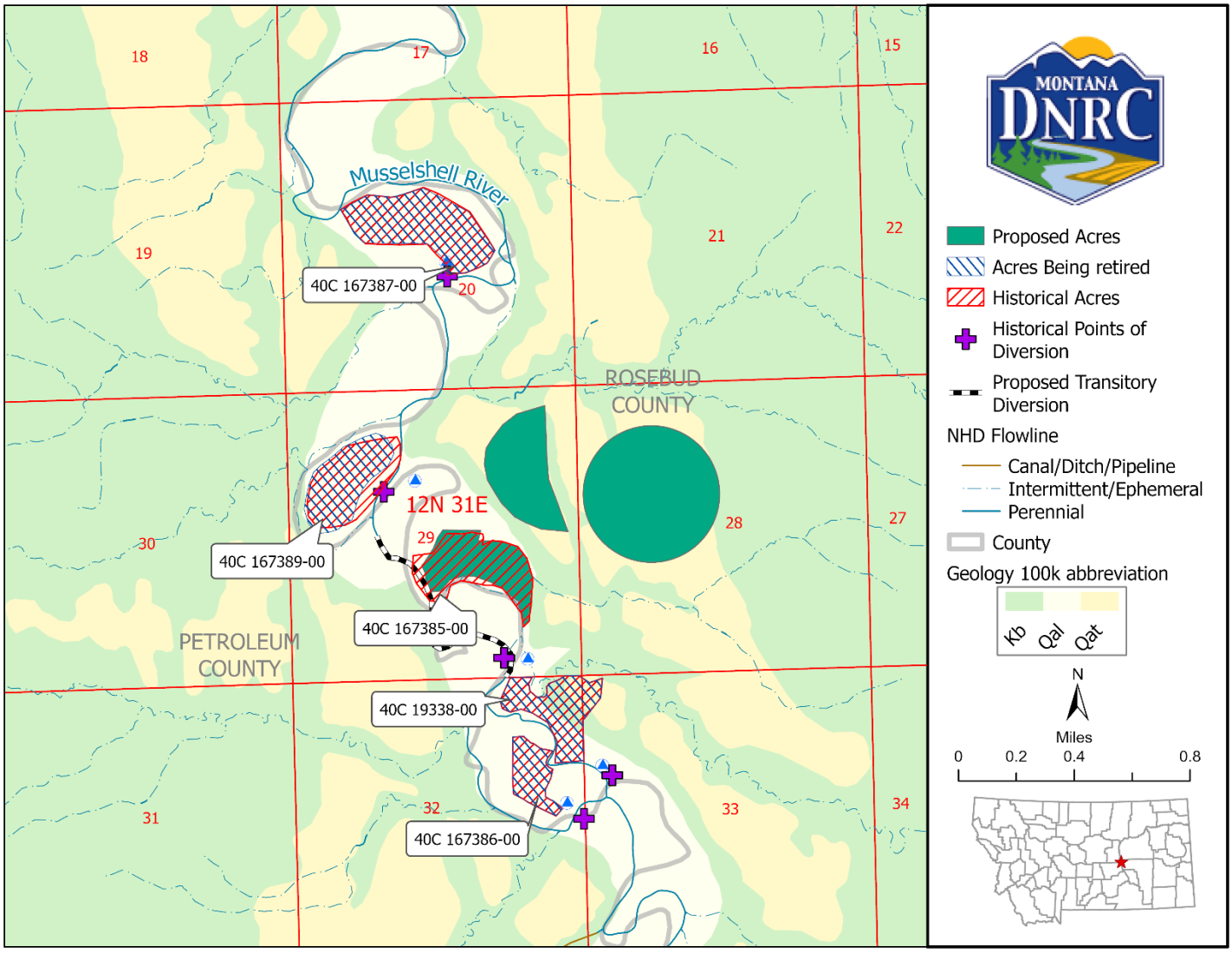


Figure 1: Overview of the proposed project. The Musselshell River flows north and is the boundary between Petroleum and Rosebud County. Individual fields within the historical POU are labeled with the corresponding water right.

WSB Technical Analysis Findings

Based on information submitted, the WSB quantified the historical non-consumed volume and location of historical return flows. These analyses are in support of the following criteria assessment: adverse effect. A summary of WSB findings described in subsequent sections are listed below.

TECHNICAL ANALYSES FINDINGS

ADVERSE EFFECT (RETURN FLOWS)	The historical non-consumed volume is 90.92 acre-feet (AF) and the location of historical return flows as identified in **Figure 2** is to the Musselshell River downstream of the western boundary of the NWSWNW Section 33, Township 12 North, Range 31 East, Rosebud County. The proposed non-consumed volume is 21.71 AF and the location of proposed return flows as identified in **Figure 2** is to the Musselshell River beginning at the northern boundary of the SESWSE Section 29, Township 12 North, Range 31 East, Petroleum County.

2.0 Methodology

DNRC will analyze the change to determine if:

a. Return flows will enter back into the source where they have historically returned upstream of or at the location of the next downstream appropriator; or,
b. Water is left instream so historically diverted flows are available during the historical period of diversion either below the point of diversion or where return flows historically returned to the source.

If neither criterion is met or return flows accrete to more than one source, the return flow analysis may include a monthly breakdown of the rate and timing of return flows and evaluate impacts to the identified rights.

Return flows are evaluated by determining the volume of water that infiltrates past the root zone and identifying the likely receiving stream(s). The assumption is made that water applied for irrigation that is not consumed by a crop infiltrates to groundwater becoming return flow and does not run off. The amount of water not consumed is the difference between the amount of water consumed and the amount of water applied to a field. The receiving stream is determined by proximity and evidence of hydraulic connection to groundwater and generally does not depend on groundwater flow direction or land slope (Leake, 2011).

Historical consumed volumes for irrigation are calculated following the procedures described in DNRC consumptive use rules in ARM 36.12.1902. The amount of water consumed at the field is equal to crop consumption plus irrecoverable losses calculated as a percent of applied amounts. The amount of water applied to a field is determined from estimates of application efficiency and crop consumption. The amount of water not consumed is the difference between the amount of water consumed and the amount of water applied to a field.

3.0 Adverse Effect – Return Flow Analysis

3.1. Consumed & Non-Consumed Volume

The consumed volume for irrigation is based on the net irrigation requirement (NIR) from USDA Natural Resources Conservation Service Irrigation Water Requirements (IWR) at a representative weather station. The NIR is multiplied by a county-wide management factor (from ARM 36.12.1902) to produce an adjusted NIR representative of actual crop yields in Montana. Crop consumption is determined by multiplying the adjusted NIR by the number of acres of irrigation. Crop consumption is then divided by the field efficiency identified from the irrigation method and ARM 36.12.115. For proposed irrigation that falls outside of the historical place of use, the Applicant has requested a field efficiency of 90%, which falls outside of the standards found in ARM 36.12.115. Deviations such as this are permissible but require supporting information from the Applicant at the time of application. Irrecoverable losses (IL) are 5% of the field applied volume for flood irrigation or 10% for sprinkler irrigation. The total consumed volume for irrigation is the sum of crop consumption and irrecoverable losses. The total non-consumed volume is the field applied volume minus the total consumed volume.

The historical and proposed consumed and non-consumed volumes have been calculated with the inputs shown in **Table 2** and **Table 3** following the methods described above and in ARM 36.12.1902.

Table 2: Historical use.

Water Right No. / Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor[2]	Field Efficiency	Crop Consumption (AF)	Applied Volume (AF)	IL (AF)	Total Consumed Volume (AF)	Non-Consumed Volume (AF)
40C 167385-00 / Flood	45.0	23.18	47.7%	60%	41.46	69.11	3.46	44.92	24.19
40C 167386-00 / Flood	16.0	23.18	47.7%	60%	14.74	24.57	1.23	15.97	8.60
40C 167387-00 / Flood	54.0	23.18	47.7%	60%	49.76	82.93	4.15	53.90	29.03
40C 19338-00 / Wheel line	35.0	23.18	47.7%	70%	32.25	46.07	4.61	36.86	9.21
40C 167389-00 / Flood	37.0	23.18	47.7%	60%	34.09	56.82	2.84	36.93	19.89
Total	187.0	-	-	-	172.30	279.50	16.29	188.58	90.92

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor

Table 3: Proposed use.

Type / Irrigation Method	Acres	IWR (in)[1]	Mgmt. Factor	Field Efficiency	Crop Consumption (AF)	Applied Volume (AF)	IL (AF)	Total Consumed Volume (AF)	Non-Consumed Volume (AF)
Within historical POU[2] / Flood	40.4	23.18	47.7%	60%	37.22	62.04	3.10	40.33	21.71
Outside historical POU[3] / Sprinkler	146.0	25.83	72.7%	90%	228.47	253.86	25.39	253.86	0.00
Total	186.4	-	-	-	265.69	315.90	28.49	294.19	21.71

[1]Ingomar IWR Weather Station
[2]Rosebud County Historical Use Management Factor
[3]Rosebud County Proposed Use Management Factor

3.2 Hydraulically Connected Surface Water(s)

Potentially affected surface waters in a return flow evaluation are identified by their hydraulic connection, both direct and indirect, to the aquifer below the irrigation place of use. Hydraulic connection depends on the depth to groundwater beneath the beds of surface waters, connection between deep and overlying shallow aquifers, vertical gradients, and can vary along a reach and with time of year.

Procedures for evaluating hydraulic connection and identifying one or more potentially affected surface water(s) for can be found in DNRC (2019). Following protocols in DNRC (2019) **Table 4** identifies published information used to assess hydraulically connected surface water(s). Not all data may be available for each project and is noted as “NA” when that occurs.

As shown in **Figure 1**, the historical and proposed POUs overlie unconsolidated alluvial sediments adjacent to the Musselshell River. The relatively thin alluvial sediments overlie the Bearpaw shale. Numerous ephemeral or intermittent streams drain upland areas surrounding the Musselshell River in the vicinity of the proposed project. These streams exhibit similar characteristics and have been grouped into east and west tributaries in **Table 4**, reflecting their position relative to the Musselshell River. The Musselshell River was also evaluated for hydraulic connection to groundwater (**Table 4**).

Table 4: Published information used to identify hydraulically connected surface water(s).

Published Information	**Surface Water Source:** Musselshell River	**Surface Water Source:** East tributaries	**Surface Water Source:** West tributaries
USGS National Hydrographic Dataset (NHD)[1]	Perennial	Intermittent/ephemeral	Intermittent/ephemeral
USGS PROSPER Dataset[2]	0.74-0.76	0.04-0.35	0.05-0.24
MBMG GWIC wells, less than 50 ft deep, within 1,000 ft of surface water, static water levels above or within 10 ft of elevation of stream bed (DNRC, 2018)[3]	None[4]	None[4]	None[4]
Published Water Table Maps, Publications, Previous Water Rights, etc.[5]	None	None	None
Gridded National Soil Survey Geographic Database[6]	Hydric conditions along channel	Minimal hydric conditions along channel	Minimal hydric conditions along channel
Aerial imagery	Wet channel	Dry channel	Dry channel
Affidavits, photographs, etc.	None	None	None

[1] Review NHD to identify perennial, intermittent, and ephemeral classifications for surface water sources most proximal to the proposed diversion(s).

[2] USGS PROSPER probability of streamflow permanence (greater than 50 percent of the time it flows).

[3] Per DNRC (2019) hydraulic connection of individual stream reaches to ground water is evaluated by comparing streambed elevations to static groundwater elevations measured in MBMG GWIC wells less than 50 ft deep and within 1,000 ft of surface water or from published water table maps. Surface water within that area is considered hydraulically connected to the unconfined aquifer if static groundwater elevations are above or within 10 ft of the elevation of the stream bed.

[4] There is limited groundwater development within 1,000 ft of surface waters adjacent to the project area; therefore, lack of wells that meet these requirements does not offer evidence for or against connection to surface water.

[5] No water table maps available.

[6] Review Gridded National Soil Survey Geographic Database to identify hydric soils or shallow water tables near surface water sources.

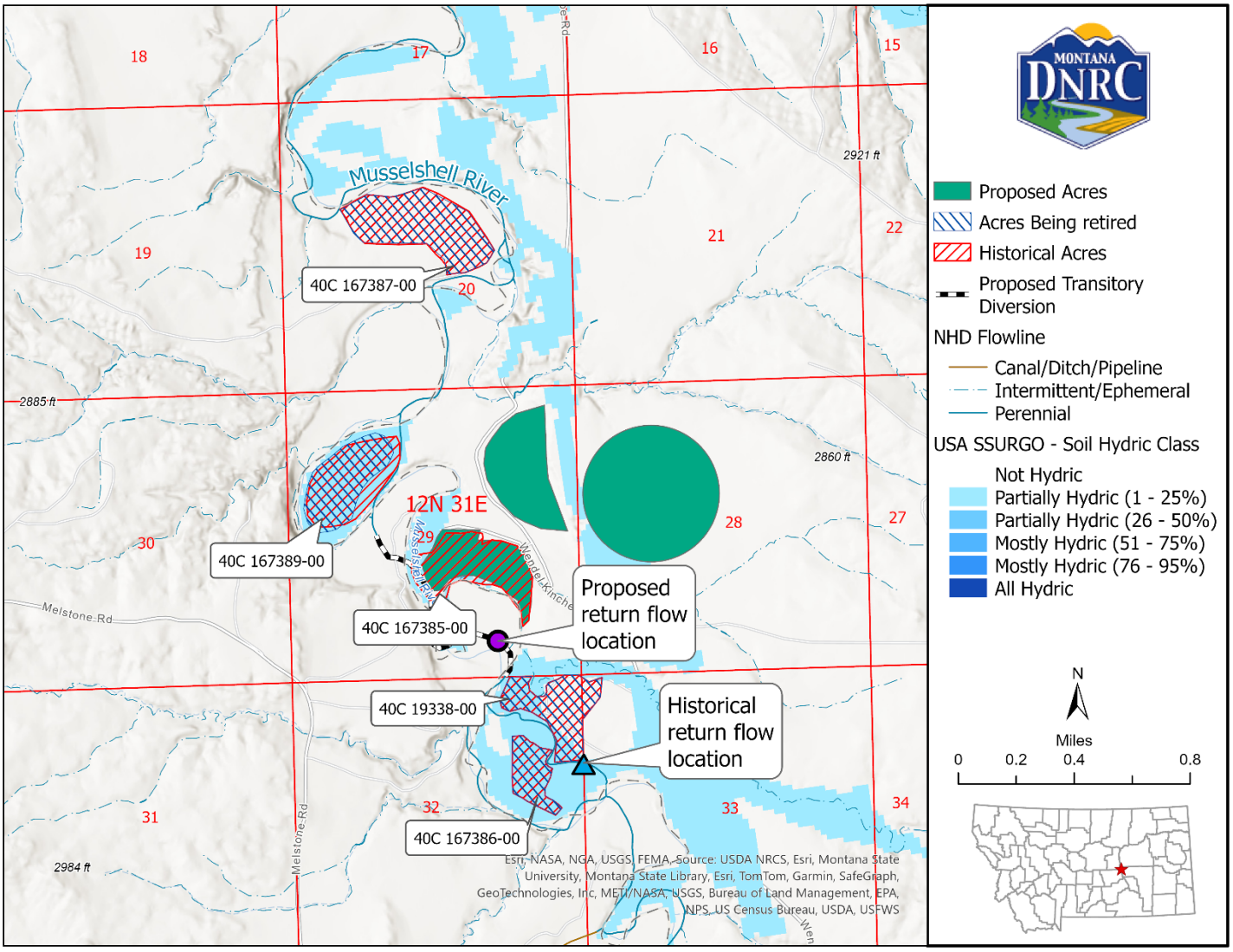


Figure 2: Location of historical and proposed irrigation and return flows.

WSB Findings

Based on the review of the published information in **Table 4**, the Musselshell River is the nearest hydraulically connected surface water source (**Figure 2**) and the receiving stream for historical and proposed return flows.

3.3 Location of Return Flows

Historical return flows total 90.92 AF from 187.0 acres of irrigation. The starting point of return flows would be on the Musselshell River downstream of the western boundary of the NWSWNW Section 33, Township 12 North, Range 31 East, Rosebud County (**Figure 2**).

Under the proposed change, return flows would be equal to 21.71 AF from 40.4 retained historical acres of irrigation and would accrue to the Musselshell River beginning at the northern boundary of the SESWSE Section 29, Township 12 North, Range 31 East, Petroleum County (**Figure 2**).

Under the proposed change, return flows would enter back into the source where they have historically returned upstream of the next downstream appropriator. In addition, the Applicant would leave a portion of historical diverted non-consumed volume instream at the historical point of diversion. Therefore, an analysis of rate and timing of return flows was not conducted.

Historically, each field was irrigated under a separate water right, as shown in **Figure 2**. Under the proposed change, all five water rights would irrigate the entire proposed POU. The proposed return flow volume attributed to each water right was calculated by multiplying the proposed return flow volume by the proportion of individual flow rates to the total flow rate, shown in **Table 5**.

Table 5: Historical and proposed annual return flow volume attributed to the water rights proposed for change.

			Return Flow Volume (AF)	
WR Number	**Flow Rate (cfs)**	**Proposed Supplemental Proportion**	**Historical**	**Proposed**
40C 167385-00	1.71	0.18	24.19	3.99
40C 167386-00	0.61	0.07	8.60	1.42
40C 167387-00	2.05	0.22	29.03	4.78
40C 167389-00	1.82	0.20	19.89	4.24
40C 19338-00	3.12	0.34	9.21	7.28
Total	9.31	1.00	90.92	21.71

Review

This document has been reviewed on September 4, 2025 in accordance with Category 7 of DNRC's Water Sciences Bureau Minimum Standards of Review, Version 2, February 2024.

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